Progress With Maths

Teachers Manual
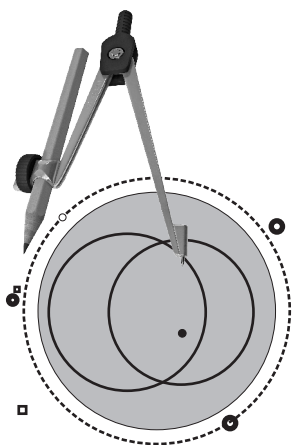
6

WRITTEN BY:
RENU SHARMA

Exercise 1.1

1. (a) T   (b) T   (c) T

   (d) F   (e) T   (f) F

   (g) T   (h) F   (i) F   (j) T

2. (a) Successor of $68 = 68 + 1 = 69$ **Ans.**
   (b) Successor of $299 = 299 + 1 = 300$ **Ans.**
   (c) Successor of $760 = 760 + 1 = 761$ **Ans.**
   (d) Successor of $7999 = 7999 + 1 = 8000$ **Ans.**
   (e) Successor of $335714 = 335714 + 1 = 335715$ **Ans.**
   (f) Successor of $8654802 = 8654802 + 1 = 8654803$ **Ans.**

3. (a) Predecessor of $600 = 600 - 1 = 599$ **Ans.**
   (b) Predecessor of $6310 = 6310 - 1 = 6309$ **Ans.**
   (c) Predecessor of $999 = 999 - 1 = 998$ **Ans.**
   (d) Predecessor of $645318 = 645318 - 1 = 645317$ **Ans.**
   (e) Predecessor of $88888 = 88888 - 1 = 88887$ **Ans.**
   (f) Predecessor of $2000000 = 2000000 - 1 = 1999999$ **Ans.**

4. (a) The next three consecutive whole numbers of $96 = 97, 98, 99$
                                               Ans.

   (b) The next three consecutive whole numbers of $199 = 200,$
      201, 202   **Ans.**

   (c) The next three consecutive whole numbers of $600 = 601,$
      602, 603   **Ans.**

   (d) The next three consecutive whole numbers of $2026 = 2027,$
      2028, 2029   **Ans.**

   (e) The next three consecutive whole numbers of $9999 = 10000,$
      10001, 10002   **Ans.**

   (f) The next three consecutive whole numbers of $4000 = 4001,$
      4002 4003   **Ans**

5. (a) Let the three consecutive whole numbers $= a, b, c$

The sum of Ist and IIIrd whole number $= 72$

Put the value of Ist and IIIrd number,

Let the value of $a = 35$, $c = 37$; $(a + c) = 72$

$$35 + 37 = 72$$

So, the value of b is 36

Hence, the value of middle number is 36. **Ans**

6. Let the two consecutive numbers are a and b.

Some of these $= 19$

Put the value of Ist and IInd number $a + b = 19$; $a + 10 = 19$

Hence, the required consecutive whole numbers are 9 and 10. **Ans.**

7. Whole number between 61 and 63 is 62. **Ans.**

Exercise 1.2

1. (a) Six lakh thirty thousand four hundred seven $= 630407$ **Ans.**

  (b) Sixty four lakh twenty thousand four hundred forty one
$$= 6420441$$ **Ans.**

  (c) One crore three hundred seventy one $= 10000371$ **Ans.**

  (d) Fourteen crore four lakh sixty four thousand five hundred
  forty five $= 14,04,64,545$ **Ans.**

2. (a) Six million two hundred sixty thousand six hundred ten
$$= 62,60,610$$ **Ans.**

  (b) Twelve million seventy three thousand three hundred four
$$= 12,073,304$$ **Ans.**

  (c) Thirty four billion seven hundred sixty million two hundred
  forty four thousand two hundred one $= 34,760,244,201$ **Ans.**

  (d) Two billion thirty three million thirty one thousand four
  hundred sixty five $= 2,033,031,465.$ **Ans.**

Progress With Maths-6

3. (a) 684078, in Indian system 6, 84, 078 and International system 684,078. **Ans.**

(b) 6245221, in Indian system 62, 45, 221 and International system 6, 245, 221. **Ans.**

(c) 60604108, in Indian system 6, 06, 04, 108 and International system 60, 604, 108. **Ans.**

(d) 827416121, in Indian system 82, 74, 16, 121 and International system 827, 416, 121. **Ans.**

(e) 426971064, in Indian system 42, 69, 71, 064 and International system 426, 971, 064. **Ans.**

(f) 4682980018, in Indian system 4, 68, 29, 80, 018 and International system 4, 682, 980, 018. **Ans.**

4. (a) $6 \times 10^{10} + 4 \times 10^{5} + 8 \times 10^{3} + 2 \times 10^{2} + 7 \times 10^{1} + 1 \times 10^{0}$
$$= 60000408271 \quad \textbf{Ans.}$$

60000 408271 in International counting system
$$= 60,000,408,271$$

(b) $9 \times 10^{9} + 6 \times 10^{7} + 4 \times 10^{6} + 5 \times 10^{5} + 2 \times 10^{4} + 8 \times 1$
$$= 9064520008 \quad \textbf{Ans.}$$

9064520008 in International counting system
$$= 9,064,520,008 \quad \textbf{Ans.}$$

5. (a) $8 \times 10^{10} + 0 \times 10^{9} + 4 \times 10^{8} + 3 \times 10^{7}$
$+ 0 \times 10^{6} + 9 \times 10^{5} + 2 \times 10^{4} + 5 \times 10^{3} = 80430925000$

i.e., $80430925000 = 80,43,09,25,000$ **Ans.**

(b) $6 \times 10^{10} + 4 \times 10^{7} + 2 \times 10^{5} + 1 \times 10^{2} + 7 \times 1 = 60040200107$
i.e., $60040200107 = 60,04,02,00,107$ **Ans.**

6. (a) $82396721 =$
$80000000 + 2000000 + 300000 + 90000 + 6000 + 700 + 20 + 1$
Ans.

(b) $953452728 = 900000000 + 50000000 + 3000000 + 400000$
$+ 50000 + 2000 + 700 + 20 + 8$ **Ans**

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7. Place value of 3 in given number $= 3000$ **Ans.**
Face value of 3 in given number $= 3$ **Ans.**

8. Place value of 7 in given number $= 7000000$ **Ans.**
Face value of 7 in given number $= 7$ **Ans.**
Difference between place value and face value
$\qquad = 7000000 - 7 = 6999993$ **Ans.**

9. Find the difference of the place value of two 6's in 896726432
Place value of Ist $6 = 6000000$
Place value of IInd $6 = 6000$
Difference between Ist 6 and IInd 6
$\qquad = 6000000 - 6000 = 5994000$ **Ans.**

10. We know that the four smallest digits are 0, 1, 2 and 3. By using these numbers, for smallest eight digit number, we keep the smallest number of left except zero and keep 3 on the right side. Let us keep 2 on the tens place and keep zero on the other place. Hence, the smallest 8 digit number is 10000023.   **Ans.**

11. We know that the three greatest digit are 7, 8 and 9. By using these numbers, for greatest 6-digiti number, we keep the 7 at ones place, 8 keep on tens place and 9 on the other place. Hence, the greatest 6-digit number is 999987.   **Ans.**

12. Digits 1, 4, 8 taking each digit once, form three digit number
148, 481, 841, 184, 418, 814   **Ans.**

13. Find the sum of the place value of three 3's in 936236436.
Ist 3's place value $= 30000000$
IInd 3's place value $= 30000$
IIIrd 3's place value $= 30$
Sum $= 30000000 + 30000 + 30 = 30030030$ **Ans.**

Exercise 1.3

1. (a) In 8digit numbers, clearly
$\qquad 83619178 < 84567894 < 86426231$
The 7-digit number is 8516329.
Which is clearly the smallest.
$\therefore \qquad 8516329 < 83619178 < 84567894 < 86426231$
Hence, the given numbers in the ascending order are:
$\qquad$ 8516329, 83619178, 84567894, 86426231.   **Ans.**

(b) In 7-digit number, clearly $6018726 < 6081241 < 8698112$
The 9-digit number is 353626801.

Which is clearly the greatest.

∴6018726 < 6081241 < 8698112 < 353626801

Hence, the given numbers in the ascending order are:

6018726, 6081241, 8698112, 353626801 **Ans.**

(c) We know that,

∵ 6-digit number < 7-digit number < 8-digit number < 9-digit number

∴210364 < 9625616 < 83765614 < 640561729

Hence, the given numbers in the ascending order are :

210364, 9625616, 83765614, 640561729 **Ans.**

(d) We know that,

∵ 6-digit number < 7-digit number < 8-digit number < 9-digit number

∴485346 < 6292468 < 84216315 < 208080608

Hence, the given number in the ascending order are :

485346, 6292468, 84216315, 208080608 **Ans.**

(e) In 8-digit number, clearly 39244685 < 42812619 < 96868816

The 7-digit number is 9168816.

Which is clearly the smallest number.

∴9168816 < 39244685 < 42812619 < 96868816

Hence, the given numbers in ascending order are:

9168816, 39244685, 42812619, 96868816 **Ans.**

2. (a) In 8-digit numbers, clearly 94627742 > 84637817 > 84636218

The 9-digit number is 845365886.

Which is clearly the greatest.

∴845365886 > 94627742 > 84637817 > 84636218

Hence, the given numbers in the descending order are:

845365886, 94627742, 84637817, 84636218. **Ans.**

(b) In 8-digit numbers, clearly 84156702 > 84156701 > 64153701

The 9-digit number is 842503971.

Which is clearly the greatest.

∴842503971 > 84156702 > 84156701 > 64153701

Hence, the given numbers in the descending order are:

842503971, 84156702, 84156701, 64153701 **Ans.**

(c) In 8-digit numbers, clearly 20396513 > 20385832 >

20348645
The 9-digit number is 203106380.
Which is clearly the greatest.
$\therefore 203106380 > 20396513 > 20385832 > 20348645$
Hence, the given numbers in the descending order are:
203106380, 20396513, 20385832, 20348645 **Ans.**

(d) In 8-digit numbers, clearly 63772124 > 61584221
The 7-digit number is 6499922.
Which is clearly the smallest
The 9-digit number is 611288401.
$\therefore 611288401 > 63772124 > 61584221 > 6499922$
Hence, the given numbers in the descending order are:
611288401, 63772124, 61584221, 6499922 **Ans.**

(e) In 8-digit numbers, clearly 65977824 > 65927821 > 65917823
The 9-digit number is 658037251.
Which is clearly the greatest.
$\therefore 658037251 > 65977824 > 65927821 > 65917823$
Hence, the given numbers in the descending order are:
658037251, 65977824, 65927821, 65917823

3. (a) 54658 > 51457 **Ans.** (b) 3167890 < 31678822 **Ans.**
(c) 639681 > 638754 **Ans.** (d) 8688260 > 8348056 **Ans.**
(e) 96432842 > 96432344 **Ans.** (f) 667347892 > 67438916 **Ans.**

Exercise 1.4

1. Books sold in first week of June = ₹ 481899

Books sold in second week of June = ₹ 601962
Total books sold together = ₹ 481899 + ₹ 601962 = ₹ 1083861
∵ ₹ 601962 > ₹ 481899
So, the greater Amount = ₹601962
How much = ₹ 601962 − ₹ 481899
= ₹ 120063
Hence, ₹ 1083861 books sold together and second walk sale is
greater ₹ 120063. **Ans.**

2. Toys manufactured in January = 74329
Toys manufactured in February = 88646
Toys manufactured in March = 806426

Total manufactured toys in three months
$= 74329 + 88646 + 806426 = 969401$
Hence, 969401 toys manufactured in three months.   **Ans.**
3. Total number of men $= 421963$
Total number of women $= 381684$
Total number of children $= 621800$
Total population of the city $= 421963 + 381684 + 621800$
$= 1425447$
Hence, the population of the city is 1425447.   **Ans.**
4. The tickets sold on first day $= 4091$
The tickets sold on second day $= 6822$
The tickets sold on third day $= 1060$
The tickets sold on final day $= 8781$
Total tickets sold on these day $= 4091 + 6822 + 1060 + 8781$
$= 20754$
Hence, 20754 tickets sold on those four days.   **Ans.**
5. Population of city was in year $2001 = 468471$
In 2011,
The population of city increased by 71651
So, th total population in $2011 = 468471 + 71651$

$$\begin{array}{r} 4\ 6\ 8\ 4\ 7\ 1 \\ +\ 7\ 1\ 6\ 5\ 1 \\ \hline 5\ 4\ 0\ 1\ 2\ 2 \end{array}$$

Thus, the population in 2011 is 540122.   **Ans.**
6. The population of city in year $2014 = 1542431$
The population of city in next year $= 1910681$
Increased in the population $= 1910681 - 1542431$

$$\begin{array}{r} 1\ 9\ 1\ 0\ 6\ 8\ 1 \\ -\ 1\ 5\ 4\ 2\ 4\ 3\ 1 \\ \hline 3\ 6\ 8\ 2\ 5\ 0 \end{array}$$

Thus, the increase of population is 368250.   **Ans.**
7. In 2014, students appeared in examination $= 48180$
In 2015, students appeared more than last year $= 6000$
So, the total student appeared in examination $= 48180 + 6000$

$$\begin{array}{r} 4\ 8\ 1\ 8\ 0 \\ +\ 6\ 0\ 0\ 0 \\ \hline 5\ 4\ 1\ 8\ 0 \end{array}$$

Thus, the 54180 students appeared in examination.   **Ans.**

8. Sachin scored in test matches $=16160$ runs
He wishes to complete $=20000$ runs
So, he need runs $=20000$ runs -16160 runs

$$
\begin{array}{r}
2\,0\,0\,0\,0 \\
-1\,6\,1\,6\,0 \\
\hline
3\,8\,4\,0 \\
\hline
\end{array}
$$

Thus, he need 3840 runs. **Ans.**

9. The examination, candidates passed $=165666$
Candidates failed $=84646$
So, the total candidates appeared in examination
$$=165666+84646$$

$$
\begin{array}{r}
1\,6\,5\,6\,6\,6 \\
+8\,4\,6\,4\,6 \\
\hline
2\,5\,0\,3\,1\,2 \\
\hline
\end{array}
$$

Thus, the total candidates are 250312. **Ans.**

10. In grain market, wheat arrived in a month $=821362$ kg
In grain market, rice arrived in a month $=820186$ kg
In grain market, barley arrived in a month $=235178$ kg
So, the total quantity of grain $=821362$ kg $+820186$ kg $+235178$ kg

$$
\begin{array}{r}
8\,2\,1\,3\,6\,2 \\
8\,2\,0\,1\,8\,6 \\
+2\,3\,5\,1\,7\,8 \\
\hline
1\,8\,7\,6\,7\,2\,6 \\
\hline
\end{array}
$$

Thus, total quantity of grain 1876726 kg. **Ans.**

11. The weight of a box containing registers $=8$ kg 135 g $=8.135$ kg
So, the weight of 205 boxes $=205\times8.135$ kg $=1667.675$ kg
$=1667$ kg 675 g
Thus, the weight of 205 boxes are 1667 kg 675 g **Ans.**

12. The monthly fee of Mahesh in a school $=$ ₹ 155

So, the monthly fee of 165 students $=165\times$ ₹ $155=$ ₹ 25575
Thus, the monthly fee of 165 students are ₹ 25575. **Ans.**

13. The difference of two numbers $=9864583$
The smaller number $=1271548$
So, the larger number $=9864583+1271548=11136131$
Thus, the larger number is 1136131. **Ans.**

14. Ticket sold on, first day = ₹ 48261

Ticket sold on, second day = ₹ 42168
Ticket sold on, third day = ₹ 86729
Ticket sold on, fourth day = ₹ 80160
So, the total amount of tickets
= ₹ 48261 + ₹ 42168 + ₹ 86729 + ₹ 80160 = ₹ 257318
Thus, the total amount of tickets = ₹ 257318 **Ans.**

15. Bicycles sold in 2012-13 = 941000
Bicycles sold in 2013-2014 = 600200
So, the bicycles sold more = 941000 − 600200 = 340800
Thus, the bicycles sold more in 2012-13 by 340800 **Ans.**

16. The paper sheet available for making notebook = 95000
Each sheet makes pages of a notebook = 8
So, the total pages for making notebooks = 95000 × 8 = 76000
Each notebook contains = 100 page
The notebooks made = 76000 ÷ 100 = 7600
Thus, the notebooks made are 7600 **Ans.**

17. The weight of 28 bags of sugar = 2626 kg 400 g or 2626.400 kg

So, the weight of 1 bag of sugar = $\dfrac{2626.400}{28}$ = 93.8 kg

The weight of 24 bages of sugar = 24 × 93.8 kg = 2251.2 kg
= 2251 kg 200 g
Thus, the weight of 24 bages of sugar = 2251 kg 200 gm **Ans.**

18. ₹ 831 equally among = 15 students

So, 1 student have = ₹ $\dfrac{831}{15}$ = ₹ 55.40

Thus, each student have ₹ 55.40 **Ans.**

Exercise 1.5

1. (a) 623 estimated to the nearest ten = 620
79 estimated to the nearest ten = 80
Hence, the required estimation = 620 + 80 = 700 **Ans.**

(b) 83 estimated to the nearest ten = 80
99 estimated to the nearest ten = 100
Hence, the required estimation = 80 + 100 = 180 **Ans.**

(c) 96 estimated to the nearest ten = 100
68 estimated to the nearest ten = 70

Hence, the required estimation $=100+70=170$ **Ans.**

(d) 246 estimated to the nearest ten $=250$

275 estimated to the nearest ten $=280$

Hence, the required estimation $=250+280=530$ **Ans.**

(e) 912 estimated to the nearest ten $=910$

821 estimated to the nearest ten $=820$

Hence, the required estimation $=910+820=1730$ **Ans.**

(f) 641 estimated to the nearest ten $=640$

375 estimated to the nearest ten $=380$

Hence, the required estimation $=640+380=1020$ **Ans.**

2. (a) 114 estimated to the nearest hundred $=100$

671 estimated to the nearest hundred $=700$

Hence, the required estimation $=100+700=800$ **Ans.**

(b) 996 estimated to the nearest hundred $=1000$

128 estimated to the nearest hundred $=100$

Hence, the required estimation $=1000+100=1100$ **Ans.**

(c) 978 estimated to the nearest hundred $=1000$

295 estimated to the nearest hundred $=300$

Hence, the required estimation $=1000+300=1300$ **Ans.**

(d) 2296 estimated to the nearest hundred $=2300$

7480 estimated to the nearest hundred $=7500$

Hence, the required estimation $=2300+7500=9800$ **Ans.**

(e) 6298 estimated to the nearest hundred $=6300$

4521 estimated to the nearest hundred $=4500$

Hence, the required estimation $=6300+4500=10800$ **Ans.**

(f) 406163 estimated to the nearest hundred $=406200$

39380 estimated to the nearest hundred $=39400$

Hence, the required estimated $=406200+39400=445600$ **Ans.**

3. (a) 91182 estimated to the nearest thousand $=91000$

21216 estimated to the nearest thousand $=21000$

Hence, the required estimation $=91000+21000=112000$ **Ans.**

(b) 80602 estimated to the nearest thousand $=81000$

21835 estimated to the nearest thousand $=22000$

Hence, the required estimated $=81000+22000=103000$ **Ans.**

(c) 21621 estimated to the nearest thousand $=22000$

21825 estimated to the nearest thousand $=22000$

Hence, the required estimation $=22000+22000=44000$**Ans.**

(d) 6238 estimated to the nearest thousand $=6000$

21682 estimated to the nearest thousand $= 22000$

Hence, the required estimated $= 6000 + 22000 = 28000$ **Ans.**

(e) 21801 estimated to the nearest thousand $= 22000$

1688 estimated to the nearest thousand $= 2000$

Hence, the required estimation $= 22000 + 2000 = 24000$ **Ans.**

(f) 14270 estimated to the nearest thousand $= 14000$

86690 estimated to the nearest thousand $= 87000$

Hence, the required estimation $= 14000 + 87000 = 101000$ **Ans.**

4. (a) 94 estimated to the nearest ten $= 90$

25 estimated to the nearest ten $= 30$

Hence, the required estimation $= 90 - 30 = 60$ **Ans.**

(b) 98 estimated to the nearest ten $= 100$

26 estimated to the nearest ten $= 30$

Hence, the required estimation $= 100 - 30 = 70$ **Ans.**

(c) 97 estimated to the nearest ten $= 100$

36 estimated to the nearest ten $= 40$

Hence, the required estimation $= 100 - 40 = 60$ **Ans.**

(d) 408 estimated to the nearest ten $= 410$

162 estimated to the nearest ten $= 160$

Hence, the required estimation $= 410 - 160 = 250$ **Ans.**

(e) 219 estimated to the nearest ten $= 220$

207 estimated to the nearest ten $= 210$

Hence, the required estimation $= 220 - 210 = 10$ **Ans.**

(f) 196 estimated to the nearest ten $= 200$

107 estimated to the nearest ten $= 110$

Hence, the required estimation $= 200 - 110 = 90$ **Ans.**

5. (a) 918 estimated to the nearest hundred $= 900$

216 estimated to the nearest hundred $= 200$

Hence, the required estimation $= 900 - 200 = 700$ **Ans.**

(b) 832 estimated to the nearest hundred $= 800$

371 estimated to the nearest hundred $= 400$

Hence, the required estimation $= 800 - 400 = 400$ **Ans.**

(c) 4651 estimated to the nearest hundred $= 4700$

2821 estimated to the nearest hundred $= 2800$

Hence, the required estimation $= 4700 - 2800 = 1900$ **Ans.**

(d) 6721 estimated to the nearest hundred $= 6700$

2091 estimated to the nearest hundred $= 2100$

Hence, the required estimation $= 6700 - 2100 = 4600$ **Ans.**

(e) 8512 estimated to the nearest hundred $= 8500$
7690 estimated to the nearest hundred $= 7700$
Hence, the required estimation $= 8500 - 7700 = 800$ **Ans.**
(f) 8890 estimated to the nearest hundred $= 8900$
4290 estimated to the nearest hundred $= 4300$
Hence, the required estimation $= 8900 - 4300 = 4600$ **Ans.**

6. (a) 82214 estimated to the nearest thousand $= 82000$
34682 estimated to the nearest thousand $= 35000$
Hence, the required estimation $= 82000 - 35000 = 47000$ **Ans.**
(b) 98015 estimated to the nearest thousand $= 98000$
34158 estimated to the nearest thousand $= 34000$
Hence, the required estimation $= 98000 - 34000 = 64000$**Ans.**
(c) 467299 estimated to the nearest thousand $= 467000$
316856 estimated to the nearest thousand $= 317000$
Hence, the required estimation $= 467000 - 317000 = 150000$**Ans.**
(d) 25875 estimated to the nearest thousand $= 26000$
24270 estimated to the nearest thousand $= 24000$
Hence, the required estimation $= 26000 - 24000 = 2000$ **Ans.**
(e) 28963 estimated to the nearest thousand $= 29000$
23215 estimated to the nearest thousand $= 23000$
Hence, the required estimation $= 29000 - 23000 = 6000$ **Ans.**
(f) 41385 estimated to the nearest thousand $= 41000$
40360 estimated to the nearest thousand $= 40000$
Hence, the required estimation $= 41000 - 40000 = 1000$ **Ans.**

Exercise 1.6

1. (a) 212 estimated to the nearest hundred $= 200$
314 estimated to the nearest hundred $= 300$
Hence, the required estimated product $= 200 \times 300 = 60000$ **Ans.**
(b) 161 estimated to the nearest hundred $= 200$
286 estimated to the nearest hundred $= 300$
Hence, the required estimated product $= 200 \times 300 = 60000$ **Ans.**
(c) 126 estimated to the nearest hundred $= 100$
256 estimated to the nearest hundred $= 300$
Hence, the required estimated product $= 100 \times 300 = 30000$ **Ans.**
(d) 706 estimated to the nearest hundred $= 700$
278 estimated to the nearest hundred $= 300$
Hence, the required estimated product $= 700 \times 300 = 210000$**Ans.**

(e) 832 estimated to the nearest hundred $= 800$
  812 estimated to the nearest hundred $= 800$
  Hence, the required estimated product $= 800 \times 800 = 640000$ **Ans.**
(f) 839 estimated to the nearest hundred $= 800$
  731 estimated to the nearest hundred $= 700$
  Hence, the required estimated product $= 800 \times 700 = 560000$ **Ans.**

2. (a) 282 estimated upwards $= 300$
  468 estimated downwards $= 400$
  Hence, the estimated product $= 300 \times 400 = 120000$ **Ans.**
  (b) 259 estimated upwards $= 300$
  246 estimated downwards $= 200$
  Hence, the estimated product $= 300 \times 200 = 60000$ **Ans.**
  (c) 161 estimated upwards $= 200$
  199 estimated downwards $= 100$
  Hence, the estimated product $= 200 \times 100 = 20000$ **Ans.**
  (d) 378 estimated upwards $= 400$
  148 estimated downwards $= 100$
  Hence, the estimated product $= 400 \times 100 = 40000$ **Ans.**
  (e) 468 estimated upwards $= 500$
  268 estimated downwards $= 200$
  Hence, the estimated product $500 \times 200 = 100000$ **Ans.**
  (f) 155 estimated upwards $= 200$
  250 estimated downwards $= 200$
  Hence, the estimated product $= 200 \times 200 = 40000$ **Ans.**

3. (a) 276 estimated upwards $= 300$
  158 estimated downwards $= 100$
  Hence, the estimated product $= 300 \times 100 = 30000$ **Ans.**
  (b) 978 estimated upwards $= 1000$
  871 estimated downwards $= 800$
  Hence, the estimated product $= 1000 \times 800 = 800000$ **Ans.**
  (c) 465 estimated upwards $= 500$
  872 estimated downwards $= 800$
  Hence, the estimated product $= 500 \times 800 = 400000$ **Ans.**
  (d) 770 estimated upwards $= 800$
  608 estimated downwards $= 600$
  Hence, the estimated product $= 800 \times 600 = 480000$ **Ans.**
  (e) 650 estimated upwards $= 700$
  851 estimated downwards $= 800$

Hence, the estimated product $= 700 \times 800 = 560000$ **Ans.**

(f) 642 estimated upwards $= 700$

614 estimated downwards $= 600$

Hence, the estimated product $700 \times 600 = 420000$ **Ans.**

4. (a) 46 estimated to the nearest ten $= 50$

61 estimated to the nearest ten $= 60$

Hence, the required estimated $= 50 \times 60 = 3000$ **Ans.**

(b) 81 estimated to the nearest ten $= 80$

27 estimated to the nearest ten $= 30$

Hence, the required estimation $= 80 \times 30 = 2400$ **Ans.**

(c) 34 estimated to the nearest ten $= 30$

62 estimated to the nearest ten $= 60$

Hence, the required estimation $= 30 \times 60 = 1800$ **Ans.**

(d) 61 estimated to the nearest ten $= 60$

87 estimated to the nearest ten $= 90$

Hence, the required estimation $= 60 \times 90 = 5400$ **Ans.**

(e) 86 estimated to the nearest ten $= 90$

23 estimated to the nearest ten $= 20$

Hence, the required estimation $= 90 \times 20 = 1800$ **Ans.**

(f) 45 estimated to the nearest ten $= 50$

71 estimated to the nearest ten $= 70$

Hence, the required estimation $= 50 \times 70 = 3500$ **Ans.**

Exercise 1.7

1. (a) $96 \div 22$ is approximately equal to $100 \div 20 = 5$ **Ans.**

(b) $67 \div 31$ is approximately equal to $60 \div 30 = 2$ **Ans.**

(c) $292 \div 44$ is approximately equal to $280 \div 40 = 7$ **Ans.**

(d) $732 \div 22$ is approximately equal to $730 \div 20 = 36.5 = 37$ **Ans.**

(e) $851 \div 38$ is approximately equal to $840 \div 40 = 21$ **Ans.**

(f) $861 \div 36$ is approximately equal to $880 \div 40 = 22$ **Ans.**

Exercise 1.8

1. (a) $28 = 10 + 10 + 8 = XXVIII$ **Ans.**

(b) $36 = 10 + 10 + 10 + 6 = XXXVI$ **Ans.**

(c) $80 = 50 + 10 + 10 + 10 = LXXX$ **Ans.**

(d) $43 = 40 + 3 = XLIII$ **Ans.**

(e) $70 = 50 + 10 + 10 = LXX$ **Ans.**

(f) $29 = 10 + 10 + 9 = XXIX$ **Ans.**

(g) $206 = 100 + 100 + 6 = CCVI$ **Ans.**

(h) $244 = 100 + 100 + 40 + 4 = CCXLIV$ **Ans.**

(i) $274 = 100 + 100 + 50 + 10 + 10 + 4 = CCLXXIV$ **Ans.**

(j) $296 = 100 + 100 + 90 + 6 = CCXCVI$ **Ans.**

(k) $300 = 100 + 100 + 100 = CCC$ **Ans.**

(l) $196 = 100 + 90 + 6 = CXCVI$ **Ans.**

(m) $876 = 500 + 100 + 100 + 100 + 50 + 10 + 10 + 6$

$= DCCCLXXVI$ **Ans.**

(n) $814 = 500 + 100 + 100 + 100 + 10 + 4 = DCCCXIV$ **Ans.**

(o) $669 = 500 + 100 + 50 + 10 + 9 = DCLXIX$ **Ans.**

(p) $4000 = \overline{IV}$ **Ans.**

2. (a) $XXXII = 30 + 2 = 32$ **Ans.**   (b) $XLVI = 40 + 6 = 46$ **Ans.**

(c) $LXXIII = 50 + 10 + 10 + 3 = 73$ **Ans.**

(d) $LXI = 50 + 10 + 1 = 61$ **Ans.**   (e) $XXXIV = 30 + 4 = 34$ **Ans.**

(f) $CCXCIX = 100 + 100 + 90 + 9 = 299$ **Ans.**

(g) $CLXVI = 100 + 50 + 10 + 6 = 166$ **Ans.**

(h) $CCXLVI = 100 + 100 + 40 + 6 = 246$ **Ans.**

(i) $DCLX = 500 + 100 + 50 + 10 = 660$ **Ans.**

(j) $XLIV = (50 - 10) + 4 = 40 + 4 = 44$ **Ans.**

(k) $CCCLXV = 100 + 100 + 100 + 50 + 10 + 5 = 365$ **Ans.**

(l) $CCXIV = 100 + 100 + 10 + 4 = 214$ **Ans.**

(m) $DCCLXVII = 500 + 100 + 100 + 50 + 10 + 7 = 767$ **Ans.**

(n) $CCLIV = 100 + 100 + 50 + 4 = 254$ **Ans.**

(o) $XCI = (100 - 10) + 1 = 90 + 1 = 91$ **Ans.**

(p) $MCCXL = 1000 + 100 + 100 + 40 = 1240$ **Ans.**

Multiple Choice Questions

(i) b   (ii) a   (iii) a   (iv) b   (v) c

Exercise 2.1

1. (a) $2873 + 135 = 135 + 2873$ **Ans.**

(b) $2379 + (4217 + 1118) = (2379 + 4217) + 1118$ **Ans.**

(c) $8623 + (1487 + 1452) = (8623 + 1487) + 1452$ **Ans.**

(d) $15039 + 0 = 15039$ **Ans.**

2. (a) $(613 + 287) + 350 = 900 + 350 = 1250$

and $613 + (287 + 350) = 613 + 637 = 1250$

Hence, $(613 + 287) + 350 = 613 + (287 + 350)$ **Ans.**

(b) $(8145 + 9955) + 3900 = 18100 + 3900 = 22000$

and $8145 + (9955 + 3900) = 8145 + 13855 = 22000$

Hence, $(8145 + 9955) + 3900 = 8145 + (9955 + 3900)$ **Ans.**

(c) $6981 + (8478 + 4332) = 6981 + 12810 = 19791$

$(6981 + 8478) + 4332 = 15459 + 4332 = 19791$

Hence, $6981 + (8478 + 4332) = (4981 + 8478) + 4332$ **Ans.**

(d) $2851 + (4168 + 2136) = 2851 + 6304 = 9155$

and $(2851 + 4168) + 2136 = 7019 + 2136 = 9155$

Hence, $2851 + (4168 + 2136) = (2851 + 4168) + 2136$ **Ans.**

3. (a) $3756 + 4246 = 8002$ and $4246 + 3756 = 8002$

Hence, $3756 + 4246 = 4246 + 3756$ **Ans.**

(b) $8721 + 2171 = 10892$ and $2171 + 8721 = 10892$

Hence, $8721 + 2171 = 2171 + 8721$ **Ans.**

(c) $1925672 + 1834321 = 3759993$

and $1834321 + 1925672 = 3759993$

Hence, $1925672 + 1834321 = 1834321 + 1925672$ **Ans.**

(d) $280296 + 120419 = 400715$ and $120419 + 280296 = 400715$

Hence, $280296 + 120419 = 120419 + 280296$ **Ans.**

4. (a) The sum of 198, 250 and 212

$\qquad = (198 + 250) + 212 = 448 + 212 = 660$

Hence, $198 + 250 + 212 = 660$ **Ans.**

(b) The sum of 1654, 8912 and $109 = (1654 + 8912) + 109$

$\qquad = 10566 + 109 = 10675$

Hence, $1654 + 8912 + 109 = 10675$ **Ans.**

(c) The sum of 1098, 2435, 102 and 1865

$= (1098 + 2435) + (102 + 1865) = 3533 + 1967 = 5500$

Hence, $1098 + 2435 + 102 + 1865 = 5500$

(d) The sum of 2808, 1631, 2376, 2024 and 148

$= (2808 + 1631) + (2376 + 2024) + 148 = 4439 + 4400 + 148$

$= 8987$ **Ans.**

Hence, $2808 + 1631 + 2376 + 2024 + 148 = 8987$ **Ans.**

5. Sum of diagonal $= 45$

Now, first number of first row $= 45 - (18 + 11) = 45 - 29 = 16$

Second number of third column $= 45 - (16 + 12) = 45 - 28 = 17$

Third number of second column $= 45 - (15 + 11) = 45 - 26 = 19$

Second number of first column $= 45 - (18 + 14) = 45 - 32 = 13$

Hence, the dropped numbers are as follows:

18	11	16
13	15	17
14	19	12

Ans.

Exercise 2.2

1. (a) $1894 - 631 =$

$$\begin{array}{r} 1\ 8\ 9\ 4 \\ -\ 6\ 3\ 1 \\ \hline 1\ 2\ 6\ 3 \end{array}$$

Check:

$$\begin{array}{r} 6\ 3\ 1 \\ +\ 1\ 2\ 6\ 3 \\ \hline 1\ 8\ 9\ 4 \end{array}$$

Hence, $1894 - 631 = 1263$

Ans.

(b) $2168 - 2071 =$

$$\begin{array}{r} 2\ 1\ 6\ 8 \\ -\ 2\ 0\ 7\ 1 \\ \hline 9\ 7 \end{array}$$

Check:

$$\begin{array}{r} 2\ 0\ 7\ 1 \\ +\ 9\ 7 \\ \hline 2\ 1\ 6\ 8 \end{array}$$

Hence, $2168 - 2071 = 97$ **Ans.**

(c) $6628 - 2968 =$

$$\begin{array}{r} 6\ 6\ 2\ 8 \\ -2\ 9\ 6\ 8 \\ \hline 3\ 6\ 6\ 0 \end{array}$$

Check:

$$\begin{array}{r} 2\ 9\ 6\ 8 \\ +3\ 6\ 6\ 0 \\ \hline 6\ 6\ 2\ 8 \end{array}$$

Hence, $6628 - 2968 = 3660$

Ans.

(d) $22315 - 15291 =$

$$\begin{array}{r} 2\ 2\ 3\ 1\ 5 \\ -1\ 5\ 2\ 9\ 1 \\ \hline 7\ 0\ 2\ 4 \end{array}$$

Check:

$$\begin{array}{r} 1\ 5\ 2\ 9\ 1 \\ +7\ 0\ 2\ 4 \\ \hline 2\ 2\ 3\ 1\ 5 \end{array}$$

Hence,
$22315 - 15291 = 7024$ **Ans.**

2. (a)

$$\begin{array}{r} 6\ 8\ 5\ 1 \\ -\ *\ *\ 4\ 8 \\ \hline 3\ 3\ *\ * \end{array}$$

Here, the sum is equal to 6851. First of all we subtract 48 from 51.

$$\begin{array}{rl} 6\ 8\ 5\ 1 & \text{(Sum)} \\ -\ *\ *\ 4\ 8 & \text{(Subtractive)} \\ \hline 3\ 3\ 0\ 3 & \text{(Difference)} \end{array}$$

Thus, we find the number that we subtract from 6851 to get 3303. hence, the difference of 6851 and 3303 is that such number which should be subtracted.

$$\begin{array}{r} 6\ 8\ 5\ 1 \\ -\ 3\ 5\ 4\ 8 \\ \hline 3\ 3\ 0\ 3 \end{array}$$

Hence,

$$\begin{array}{r} 6\ 8\ 5\ 1 \\ -\boxed{3}\boxed{5}4\ 8 \\ \hline 3\ 3\boxed{0}\boxed{3} \end{array}$$

(b)

$$\begin{array}{r} 3\ 1\ 9 \\ -\ *\ 6\ * \\ \hline 1\ *\ 4 \end{array}$$

Here, the sum is equal to 319. First of all we subtract 4 from 9. Then we subtract 6 from 11.

```
  3 1 9   (Sum)
− * 6 5   (Subtractive)
  1 5 4   (Difference)
```

Thus, we find the number that we subtract from 319 to get 154 is that such number which should be subtracted.

```
  3 1 9
− 1 6 5
  1 5 4
```

Hence,
```
      3 1 9
    − [1] 6 [5]
      1 [5] 4
```

(c)
```
    9 8 5
  − 1 * 6
    * 7 *
```

Here, the sum is equal to 985. First of all we subtract 6 from 15. Then we subtract

```
  9 8 5   (Sum)
− 1 * 6   (Subtractive)
  8 7 9   (Difference)
```

Thus, we find the number that we subtract from 985 to get 879. Here, the difference of 985 and 879 is that such nuber which should be subtracted.

```
    9 8 5
  − 1 0 6
    8 7 9
```

Hence,
```
    9 8 5
  − 1 [0] 6
    [8] 7 [9]
```

(d)
```
  2 0 0 0 0 0
  −   * * * 2
    * 3 2 0 *
```

Here, the sum is equal to 200000. First of all we subtract 2 from 10.
```
  2 0 0 0 0 0   (Sum)
  −     * * * 2  (Subtractive)
  1 9 3 2 0 8   (Difference)
```

Thus, we find the number that we subtract from 200000 to get 193208. Hence, the difference of 200000 and 193208 is that such number which should be subtracted.

```
  2 0 0 0 0 0
  −     6 7 9 2
  1 9 3 2 0 8
```

Hence,
```
  2 0 0 0 0 0
  −   [6][7][9][2]
  1 [9] 3 2 0 [8]
```

3. Greatest 5-digit number
$= 99999$
and smallest 6-digit number
$= 100000$
Difference
$= 100000 − 99999 = 1$
Thus, $100000 − 99999 = 1$ **Ans.**

4. Amit have money = ₹ 37915

He withdrawn = ₹ 28950
So, money left
= ₹ 37915 − ₹ 28950
```
      3 7 9 1 5
    − 2 8 9 5 0
        8 9 6 5
```

Hence, he left money ₹ 8965
Ans.

5. The population of city $= 985976$
The population of men $= 385418$
The population of women $= 462890$
So, the population of men and women $= 385418 + 462890$
$$= 848308$$
So, the population of children = Total population − Population
of men and women $= 985976 - 848308 = 137668$
Hence, the population of children $= 137668$ **Ans.**

6. The sum of two numbers $= 966432$
First number $= 232767$
The sum of two numbers = First number + Second number
Put the values of these, $966432 = 232767 +$ second number
$966432 - 232767 =$ second number
$733665 =$ second number
$\therefore$ second number $= 733665$
Hence, the second number $= 733665$ **Ans.**

7. Total onions in godown $= 20791$ quintal
Onions sold in first week $= 6848$ quintal
Onions sold in second week $= 3298$ quintal
Total onions sold in both weeks $= 6848$ quintal $+ 3298$ quintal
$= 10146$ quintal
Onions left = Total onions in godown − Total onions sold in
both weeks
$= 20791$ quintal $- 10146$ quintal $= 10645$ quintal
Hence, the onions left $= 10645$ quintal **Ans.**

8. (a) $x + 17 = 65$ or $x = 65 - 17$ or $x = 48$
Hence, the value of $x = 48$ **Ans.**
(b) $x + 9 = 43$ or $x = 43 - 9$ $x = 34$
Hence, the value of $x = 34$ **Ans.**
(c) $x + 35 = 82$ $x = 82 - 35$ $x = 47$
Hence, the value of $x = 47$ **Ans.**
(d) $x + 7 = 18$ $x = 18 - 7$ $x = 11$
Hence, the value of $x = 11$ **Ans.**

Exercise 2.3

1. (a) $18 \times 10 = 180$ (b) $4718 \times 0 = 0$ (c) $289 \times 1 = 289$
(d) $648 \times 362 = 362 \times 648$
(e) $205 \times (125 \times 280) = (205 \times 125) \times 280$

(f) $442 \times (215 + 111) = 442 \times 215 + (442 \times 111)$

(g) $1637 \times (435 - 396) = 1637 \times (435) - 1637 \times 396$

(h) $1816 \times 355 + 1816 \times 245 = 1816 \times (355 + 245)$

2. (a) $84 \times 24 = (80 + 4) \times 24 = 80 \times 24 + 4 \times 24 = 1920 + 96 = 2016$

Thus, $84 \times 24 = 2016$ **Ans.**

(b) $999 \times 145 = (1000 - 1) \times 145 = 1000 \times 145 - 1 \times 145 = 145000 - 145 = 144855$

Thus, $999 \times 145 = 144855$ **Ans.**

(c) $1885 \times 35 = (2000 - 115) \times 35 = 2000 \times 35 - 115 \times 35$
$= 70000 - 4025 = 65975$

Thus, $1885 \times 35 = 65975$ **Ans.**

(d) $1135 \times 120 = (1200 - 65)120 = 1200 \times 120 - 65 \times 120$
$= 144000 - 7800 = 136200$

Thus, $1135 \times 120 = 136200$ **Ans.**

(e) $24218 \times 235 = (24000 + 200 + 18) \times 235 = 24000 \times 235$
$+ 200 \times 235 + 18 \times 235 = 5640000 + 47000 + 4230 = 5691230$

Thus, $24218 \times 235 = 5691230$ **Ans.**

(f) $10018 \times 2020 = (10000 + 18) \times 2020 = 10000 \times 2020 +$
$18 \times 2020 = 20200000 + 36360 = 20236360$

Thus, $10018 \times 2020 = 20236360$ **Ans.**

3. (a) $4 \times 150 \times 15 = (4 \times 15) \times 150 = 60 \times 150 = 9000$

Thus, $4 \times 150 \times 15 = 9000$ **Ans.**

(b) $5 \times 558 \times 90 = (5 \times 90) \times 558 = 450 \times 558 = 251100$

Thus, $5 \times 558 \times 90 = 251100$ **Ans.**

(c) $35 \times 2835 \times 60 = (35 \times 60) \times 2835 = 2100 \times 2835 = 5953500$

Thus, $35 \times 2835 \times 60 = 5953500$ **Ans.**

(d) $60 \times 3925 \times 8 \times 10 = (60 \times 8 \times 10) \times 3925 = 4800 \times 3925$
$= 18840000$

Thus, $60 \times 3925 \times 8 \times 10 = 18840000$ **Ans.**

4. (a) $819 \times 6 + 819 \times 4 = 819 \times (6 + 4) = 819 \times 10 = 8190$

Thus, $819 \times 6 + 819 \times 4 = 8190$ **Ans.**

(b) $84371 \times 36 + 64 \times 84371 = 84371 \times (36 + 64) = 84371 \times 100$
$= 8437100$

Thus, $84371 \times 36 + 64 \times 84371 = 8437100$ **Ans.**

(c) $40183 \times 194 - 40183 \times 94 = 40183 \times (194 - 94)$
$= 40183 \times 100 = 4018300$

Thus, $40 \times 183 \times 194 - 40183 \times 94 = 4018300$

(d) $615 \times 99 + 615 = 615 \times 99 + 615 \times 1 = 615 \times (99 + 1)$
$= 615 \times 100 = 61500$

Thus, $615 \times 99 + 615 = 61500$ **Ans.**

(e) $612 \times 10 \times 693 - 593 \times 6120 = 6120 \times 693 - 593 \times 6120$
$= 6120 \times (693 - 593) = 6120 \times 100 = 612000$

Thus, $612 \times 10 \times 693 - 593 \times 6120 = 612000$ **Ans.**

(f) $12 \times 890 \times 6 + 4 \times 7 \times 890 = 890 \times (12 \times 6 + 4 \times 7)$
$= 890 \times (72 + 28) = 890 \times 100 = 89000$

Thus, $12 \times 890 \times 6 + 4 \times 7 \times 890 = 89000$ **Ans.**

5. A dealer bought motorcycles $= 335$

Cost of each motorcycles = ₹ 61550

So, the total cost of all motorcycles $= 335 \times$ ₹ 61550
= ₹ 20619250

Hence, the cost of all motorcycles = ₹ 20619250 **Ans.**

6. Largest 6-digit number $= 999999$

Smallest 5-digit number $= 10000$

Product $= 999999 \times 10000 = (1000000 - 1) \times 10000$
$= 1000000 \times 10000 - 1 \times 10000 = 10000000000 - 10000$
$= 9999990000$

Hence, $999999 \times 10000 = 9999990000$ **Ans.**

7. Chairs bought by a school $= 650$

Tables bought by a school $= 650$

Cost of each chair = ₹ 180

Cost of each table = ₹ 220

Total cost of all chairs $= 650 \times$ ₹180 = ₹ 117000

Total cost of all tables $= 650 \times$ ₹ 220 = ₹ 143000

So, the total cost of all chairs and tables = ₹ 117000 + ₹ 143000
= ₹ 260000

Hence, the total cost of chairs and tables = ₹ 260000 **Ans.**

8. $n = 10, 12$ and 20

Prove that: $1 + 2 + 3 + \ldots \ldots + n = \dfrac{n(n+1)}{2}$

If $n = 10$, then

(i) $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55$ and
$\dfrac{n(n+1)}{2} = \dfrac{10(10+1)}{2} = \dfrac{10 \times 11}{2} = 55$

(ii) If $n = 12$, then
$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 = 78$ and

$$\frac{n(n+1)}{2} = \frac{12(12+1)}{2} = \frac{12 \times 13}{2} = 78$$

(iii) If $n = 20$, then

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + ... + 20 = 210 \text{ and } \frac{n(n+1)}{2}.$$

$$= \frac{20(20+1)}{2} = \frac{20 \times 21}{2} = 210$$

Hence, yes these all above are true. **Ans.**

Exercise 2.4

1. (a) $4562 \div 12$

```
        380
   12) 4 5 6 2
       −3 6 ↓
           9 6
          −9 6 ↓
             0 2
```

Dividend $(a) = 4562$,
Divisor $(b) = 12$,
Quotient $(q) = 380$
Check: and remainder
$(r) = 02$
By division algorithm
$a = bq + r$
$4562 = 12 \times 380 + 02$ or
$4562 = 4560 + 02$ or
$4562 = 4562$
(b) $8109 \div 29$

```
        279
   29) 8 1 0 9
       −5 8 ↓
        2 3 0
       −2 0 3 ↓
          2 7 9
         −2 6 1
            1 8
```

Check: Dividend
$(a) = 8109$, Divisor $(b) = 29$,
Quotient $(q) = 279$ and
remainder $(r) = 18$
By division algorithm
$a = bq + r$
$8109 = 29 \times 279 + 18$ or
$8109 = 8091 + 18$ or
$8109 = 8109$
(c) $65810 \div 121$

```
          543
   121) 6 5 8 1 0
        −6 0 5 ↓
          5 3 1
         −4 8 4 ↓
            4 7 0
           −3 6 3
            1 0 7
```

Check: Dividend
$(a) = 65810$, Divisor
$(b) = 121$, Quotient $(q) = 543$
and remainder $(r) = 107$
By divison algorithm
$a = bq + r$
$65810 = 121 \times 543 + 107$ or
$65810 = 65703 + 107$ or
$65810 = 65810$

(d) $95850 \div 215$

$$
\begin{array}{r}
445 \\
215\overline{)95850} \\
-860 \\
\hline
985 \\
-860 \\
\hline
1250 \\
-1075 \\
\hline
175
\end{array}
$$

Check: Dividend
(a) = 95850, Divisor
(b) = 215, Quotient (q) = 445
and remainder (r) = 175
By divison algorithm
$a = bq + r$
$95850 = 215 \times 445 + 175$ or
$95850 = 95675 + 175$ or
$95850 = 95850$

2. (a) $8049 \div 3$

$$
\begin{array}{r}
2683 \\
3\overline{)8049} \\
-6 \\
\hline
20 \\
-18 \\
\hline
24 \\
-24 \\
\hline
09 \\
-9 \\
\hline
\times
\end{array}
$$

Check: Corresponding
multiplication = Divisor ×
Quotient
$= 3 \times 2683 = 8049$ **Ans.**
(b) $9231 \div 17$

$$
\begin{array}{r}
543 \\
17\overline{)9231} \\
-85 \\
\hline
73 \\
-68 \\
\hline
51 \\
-51 \\
\hline
\times
\end{array}
$$

Check: Corresponding
multiplication = Divisor ×
Quotient
$= 17 \times 543 = 9231$ **Ans.**
(c) $60192 \div 264$

$$
\begin{array}{r}
228 \\
264\overline{)60192} \\
-528 \\
\hline
739 \\
-528 \\
\hline
2112 \\
-2112 \\
\hline
\times
\end{array}
$$

Check: Corresponding
multiplication = Divisor ×
Quotient
$= 264 \times 228 = 60192$ **Ans.**
(d) $46866 \div 219$

$$
\begin{array}{r}
214 \\
219\overline{)46866} \\
-438 \\
\hline
306 \\
-219 \\
\hline
876 \\
-876 \\
\hline
\times
\end{array}
$$

Check: Corresponding multiplication = Divisor × Quotient

$= 219 \times 214 = 46866$ **Ans.**

3. (a) $2635 \div 12$

$$
\begin{array}{r}
219 \\
12 \overline{)\ 2\ 6\ 3\ 5} \\
-2\ 4 \\
\hline
2\ 3 \\
-1\ 2 \\
\hline
1\ 1\ 5 \\
-1\ 0\ 8 \\
\hline
7
\end{array}
$$

Thus, quotient $= 219$ and remainder $= 7$ **Ans.**

(b) $3440 \div 18$

$$
\begin{array}{r}
191 \\
18 \overline{)\ 3\ 4\ 4\ 0} \\
-1\ 8 \\
\hline
1\ 6\ 4 \\
-1\ 6\ 2 \\
\hline
2\ 0 \\
-1\ 8 \\
\hline
2
\end{array}
$$

Thus, quotient $= 191$ and remainder $= 2$ **Ans.**

(c) $72879 \div 121$

$$
\begin{array}{r}
602 \\
121 \overline{)\ 7\ 2\ 8\ 7\ 9} \\
-7\ 2\ 6 \\
\hline
2\ 7\ 9 \\
-2\ 4\ 2 \\
\hline
3\ 7
\end{array}
$$

Thus, quotient $= 602$ and remainder $= 37$ **Ans.**

(d) $27829 \div 115$

$$
\begin{array}{r}
241 \\
115 \overline{)\ 2\ 7\ 8\ 2\ 9} \\
-2\ 3\ 0 \\
\hline
4\ 8\ 2 \\
-4\ 6\ 0 \\
\hline
2\ 2\ 9 \\
-1\ 1\ 5 \\
\hline
1\ 1\ 4
\end{array}
$$

Thus, quotient $= 241$ and remainder $= 114$

4. Least 6-digit number $= 100000$

Exactly divided by $= 235$

$$
\begin{array}{r}
425 \\
235 \overline{)\ 1\ 0\ 0\ 0\ 0\ 0} \\
-9\ 4\ 0 \\
\hline
6\ 0\ 0 \\
-4\ 7\ 0 \\
\hline
1\ 3\ 0\ 0 \\
-1\ 1\ 7\ 5 \\
\hline
1\ 2\ 5
\end{array}
$$

Here, reminder $= 125$

$\therefore$ The required number

$= 100000 + (235 - 125)$

$= 100110$

Hence, 100110 is exactly divided by 235. **Ans.**

5. First we divide 1000 by 45 and find the remainder.

$$
\begin{array}{r}
22 \\
45 \overline{)\ 1\ 0\ 0\ 0} \\
-9\ 0 \\
\hline
1\ 0\ 0 \\
-9\ 0 \\
\hline
1\ 0
\end{array}
$$

Here, remainder $= 10$

Progress With Maths-6

Required number = divisor −
remainder $= 45 - 10 = 35$
Thus, required number $= 35$

Ans.

6. Largest 5-digit number
$= 99999$
Exactly divided by $= 116$

$$
\begin{array}{r}
862 \\
116\overline{)99999} \\
-928 \\
\hline
719 \\
-696 \\
\hline
239 \\
-232 \\
\hline
07 \\
\end{array}
$$

Here, remainder $= 7$
∴ Required number
$= 99999 - 7 = 99992$
Hence, 99992 is exactly
divided by 116. **Ans.**

7. Let the required number be
$= x$
The product $= 201036$
So, $132 \times x = 201036$
or $x = \dfrac{201036}{132}$
or $x = 201036 \div 132$

$$
\begin{array}{r}
1523 \\
132\overline{)201036} \\
-132 \\
\hline
690 \\
-660 \\
\hline
303 \\
-264 \\
\hline
396 \\
-396 \\
\hline
\times \\
\end{array}
$$

Hence, the number
multiplied by 132 is 1523 to
get the 201036. **Ans.**

8. Let the other number $= x$
First number $= 220$
The product of both $= 86900$
So, $x \times 220 = 86900$
$x = \dfrac{86900}{220}$
$x = 869000 \div 220$

$$
\begin{array}{r}
395 \\
220\overline{)86900} \\
-660 \\
\hline
2090 \\
-1980 \\
\hline
1100 \\
1100 \\
\hline
\times \\
\end{array}
$$

∴ $x = 395$
Hence, the other number is
395. **Ans.**

9. Train cover the distance in
an hour $= 225$ km
Let the train takes x hours to
cover the distance.
The distance $= 4725$ km
So, $x = 4725 \div 225$

$$
\begin{array}{r}
21 \\
225\overline{)4725} \\
-450 \\
\hline
225 \\
-225 \\
\hline
\times \\
\end{array}
$$

Hence, train takes 21 hours
to cover the distance. **Ans.**

10. The cost price of 22 washing machines = ₹ 370810

So, the cost of one machine = ₹ $370810 \div 22$

$$
\begin{array}{r}
16855 \\
22\overline{)\,370810} \\
-22 \\
\hline
150 \\
-132 \\
\hline
188 \\
-176 \\
\hline
121 \\
-110 \\
\hline
110 \\
-110 \\
\hline
\times
\end{array}
$$

Hence, the cost of one machine = ₹ 16855   **Ans.**

Exercise 2.5

1. (a) $216 \div 4 + 7 = (216 \div 4) + 7$ (operation of division)

              $= 54 + 7$ (operation of addition)

              $= 61$

     Thus, $216 \div 4 + 7 = 61$ **Ans.**

     (b) $69 - 42 \div 6 = 69 - (42 \div 6)$ (operation of division)

              $= 69 - 7$ (operation of subtraction)

              $= 62$ **Ans.**

     (c) $18 - (9 \times 2) + 3 = 18 - 18 + 3$ (operation of addition)

                  $= 21 - 18$ (operation of subtraction)

                  $= 3$

     Thus, $18 - (9 \times 2) + 3 = 3$ **Ans.**

     (d) $22 + 36 \div 4 - 1 \times 8 = 22 + (36 \div 4) - 1 \times 8$ (operation of division)

                  $= 22 + 9 - (1 \times 8)$ (operation of multiplication)

                  $= (22 + 9) - 8$ (operation of addition)

                  $= 31 - 8$ (operation of subtraction)

                  $= 23$

     Thus, $22 + 36 \div 4 - 1 \times 8 = 23$ **Ans.**

     (e) $18 + 54 \div 6 - 5 \times 2 = 18 + (54 \div 6) - 5 \times 2$ (operation of division)

                  $= 18 + 9 - (5 \times 2)$ (operation of multiplication)

                  $= (18 + 9) - 10$ (operation of addition)

                                                 Progress With Maths-6

$= 27 - 10$ (operation of subtraction)

$= 17$

Thus, $18 + 54 \div 6 - 5 \times 2 = 17$ **Ans.**

(f) $(-9) + (-6) \div (-3) = (-9) + [(-6) \div (-3)]$

(operation of division)

$= (-9) + [-6 \div -3]$

$= (-9) + 2$ (operation of addition)

$= -9 + 2 = -7$

Thus, $(-9) + (-6) \div (-3) = -7$ **Ans.**

(g) $(-136) \times (-1) + (-24) \div 6 = (-136) \times (-1) + [(-24) \div 6]$

(operation of division)

$= (-136) \times (-1) + [-24 \div 6]$

$= [(-136) \times (-1)] + (-4)$ (operation of multiplication)

$= -136 \times -1 + (-4)$

$= 136 + (-4)$ (operation of addition)

$= 136 - 4 = 132$

Thus, $(-136) \times (-1) + (-24) \div 6 = 132$ **Ans.**

(h) $(-5) - (-45) \div (-15) + (-3) \times 5$

$= (-5) - [(-45) \div (-15)] + (-3) \times 5$ (operation of division)

$= (-5) - [-45 \div -15] + (-3) \times 5$

$= (-5) - (3) + [(-3) \times 5]$ (operation of multiplication)

$= -5 - 3 - 15 = -23$

Thus, $(-5) - (45) \div (-15) + (-3) \times 5 = -23$ **Ans.**

2. (a) $48 - [14 + \{16 - \overline{28 - 5}\}]$

$= 48 - [14 + \{16 - 28 + 5\}]$ (remove the bar bracket)

$= 48 - [14 + \{16 - 23\}]$ (remove the curly bracket)

$= 48 - [14 - 7]$ (remove the big bracket)

$= 48 - 7 = 41$

Thus, $48 - [14 + \{16 - \overline{28 - 5}\}] = 41$ **Ans.**

(b) $49 + \{(25 \div 5) \div 3 - 2 \times 8\}$ (remove the small bracket)

$= 49 + \{5 \div 3 - 2 \times 8\}$ (remove the curly bracket)

$= 49 + \dfrac{5}{3} - 16 = 49 + \dfrac{5 - 48}{3} = \dfrac{147 + 5 - 48}{3}$

$= \dfrac{104}{3} = 34\dfrac{2}{3}$

Thus, $49 + \{(25 \div 5) \div 3 - 2 \times 8\} = 34\dfrac{2}{3}$ **Ans.**

(c) $71 - [16 + \{26 - \overline{19 - 6}\}]$ (remove the bar bracket)

$\quad = 71 - [16 + \{26 - 13\}]$ (remove the curly bracket)

$\quad = 71 - [16 + 13]$ (remove the big bracket)

$\quad = 71 - 29 = 42$

Thus, $71 - [16 + \{26 - \overline{19 - 6}\}] = 42$ **Ans.**

(d) $83 - [35 - \{18 + (16 - 12)\}]$ (remove the small bracket)

$\quad\quad = 83 - [35 - \{18 + 4\}]$ (remove the curly bracket)

$\quad\quad = 83 - [35 - 22]$ (remove the big bracket)

$\quad\quad = 83 - 13 = 70$

Thus, $83 - [35 - \{18 + (16 - 12)\}] = 70$ **Ans.**

(e) $80 \times [56 - \{7 \times 8 + (23 - 12 \times 5)\}]$ (remove the small bracket)

$\quad\quad = 80 \times [56 - \{7 \times 8 + (23 - 60)\}]$

$\quad\quad = 80 \times [56 - \{56 - 37\}]$ (remove the curly bracket)

$\quad\quad = 80 \times [56 - 19]$ (remove the big bracket)

$\quad\quad = 80 \times 37 = 2960$

Thus, $80 \times [56 - \{7 \times 8 + (23 - 12 \times 5)\}] = 2960$ **Ans.**

(f) $40 - [25 - \{8 - (6 - \overline{8 - 2})\}]$ (remove the bar bracket)

$\quad\quad = 40 - [25 - \{8 - (6 - 6)\}]$ (remove the small bracket)

$\quad\quad = 40 - [25 - \{8 - 0\}]$ (remove the curly bracket)

$\quad\quad = 40 - [25 - 8]$ (remove the big bracket)

$\quad\quad = 40 - 17 = 23$

Thus, $40 - [25 - \{8 - (6 - \overline{8 - 2})\}] = 23$ **Ans.**

(g) $13 - [13 - \{3 - (3 - \overline{3 - 3})\}]$ (remove the bar bracket)

$\quad\quad = 13 - [13 - \{3 - (3 - 0)\}]$ (remove the small bracket)

$\quad\quad = 13 - [13 - \{3 - 3\}]$ (remove the curly bracket)

$\quad\quad = 13 - [13 - 0]$ (remove the bg bracket)

$\quad\quad = 13 - 13 = 0$

Thus, $13 - [13 - \{3 - (3 - \overline{3 - 3})\}] = 0$ **Ans.**

(h) $83 + [23 - \{18 \div (17 + 4 \times 2 - 19)\}]$ (remove the small bracket)

$\quad\quad = 83 + [23 - \{18 \div (17 + 8 - 19)\}]$

$\quad\quad = 83 + [23 - \{18 \div 6\}]$ (remove curly bracket)

$\quad\quad = 83 + [23 - 3]$ (remove by bracket)

$\quad\quad = 83 + 20 = 103$

Thus, $83 + [23 - \{18 \div (17 + 4 \times 2 - 19)\}] = 103$ **Ans.**

(i) $12 - [121 \div (11 \times 11) - (-4) - \{3 - \overline{8 - 1}\}]$

$\quad\quad\quad\quad$ (remove the bar bracket)

$= 12 - [121 \div (11 \times 11) - (-4) - (3 - 7)]$

$$\text{(remove the small bracket)}$$
$$= 12 - [121 \div 121 + 4 - \{3 - 7\}] \text{ (remove the curly bracket)}$$
$$= 12 - [121 \div 121 + 4 - \{-4\}]$$
$$= 12 - [121 \div 121 + 4 + 4] \text{ (remove the big bracket)}$$
$$= 12 - [1 + 4 + 4] = 12 - 9 = 3$$
$$\text{Thus, } 12 - [121 \div (11 \times 11) - (-4) - \{-3 - 8 - 1\}] = 3 \qquad \textbf{Ans.}$$

(j) $45 - (-6)\{4 - \overline{6 - 2}\} \div 3\{5 + (-2) \times (-6)\}$

$$\text{(remove the bar bracket)}$$
$$= 45 - (-6)\{4 - 4\} \div 3\{5 + (-2) \times (-6)\}$$
$$\text{(remove the small bracket)}$$
$$= 45 + 6\{4 - 4\} \div 3\{5 + -2 \times -6\} \text{ (remove the curly bracket)}$$
$$= 45 + 6 \times 0 \div 3 \times \{5 + 12\}$$
$$= 45 + 0 \div 3 \times \{5 + 12\}$$
$$= 45 + 0 \div 3 \times 17 = 45 - 0 \div 51 = 45 - 0 = 45 \qquad \textbf{Ans.}$$

(k) $80 - 5 \times 2 \text{ of } 4 + (19 - 3) \div 8 = 80 - 5 \times 2 \times 4 + 16 \div 8$
$$= 80 - 5 \times 2 \times 4 + 16 \div 8 = 80 - 5 \times 8 + 16 \div 8$$
$$= 80 - 5 \times 8 + 2 = 80 - 40 + 2 = 40 + 2 = 42$$
$$\text{Thus, } 80 - 5 \times 2 \text{ of } 4 + (19 - 3) \div 8 = 42 \qquad \textbf{Ans.}$$

(l) $(-72) + (-6) \div 2[(-5) \text{ of } (-4) - \{4 - (2 - 5)\}]$
$$= (-72) + (-6) \div 2[(-5) \times (-4) - \{4 + 3\}]$$
$$= (-72) + (-6) \div 2[20 - 7]$$
$$= (-72) + (-6) \div 2 \times 13$$
$$= (-72) + \frac{(-6)}{26} = (-72) + \frac{(-3)}{13} = -72 - \frac{3}{13} = -72\frac{3}{13}$$
$$\text{Thus, } (-72) + (-6) \div 2[(-5) \text{ of } (-4) - \{4 - (2 - 5)\}] = -72\frac{3}{13}$$
$$\textbf{Ans.}$$

(m) $19 - [4.7 - \{1.7 - (3.3 - 2.3) - 3.7\}]$
$$= 19 - [4.7 - \{1.7 - 1 - 3.7\}] = 19 - [4.7 - \{-3\}] = 19 - [4.7 + 3]$$
$$= 19 - 7.7 = 11.3 = \frac{113}{10} = 11\frac{3}{10}$$
$$\text{Thus, } 19 - [4.7 - \{1.7 - (3.3 - 2.3) - 3.7\}] = 11\frac{3}{10} \qquad \textbf{Ans.}$$

(n) $29 - [3.6 - \{1.8 - (1.3 - 2.5) - 4.37\}]$
$$= 29 - [3.6 - \{1.8 - (-1.2) - 4.37\}] = 29 - [3.6 - \{1.8 + 1.2 - 4.37\}]$$
$$= 29 - [3.6 - \{-1.37\}] = 29 - [3.6 + 1.37]$$

$$= 29 - 4.97 = 24.03 = \frac{2403}{100} = 24\frac{3}{100}$$

Thus, $29 - [3.6 - \{1.8 - (1.3 - 2.5) - 4.37\}] = 24\frac{3}{100}$ **Ans.**

(o) $7\frac{5}{9} - \left[4\frac{1}{9} \div \left\{14 \times 2 - \left(2\frac{1}{18} - 2\frac{1}{2}\right)\right\}\right]$

$$= \frac{68}{9} - \left[\frac{37}{9} \div \left\{28 - \left(\frac{37}{18} - \frac{5}{2}\right)\right\}\right]$$

$$= \frac{68}{9} - \left[\frac{37}{9} \div \left\{28 - \frac{37 - 45}{18}\right\}\right] = \frac{68}{9} - \left[\frac{37}{9} \div \left\{28 - \frac{-8}{18}\right\}\right]$$

$$= \frac{68}{9} - \left[\frac{37}{9} \div \left\{\frac{504 + 8}{18}\right\}\right] = \frac{68}{9} - \left[\frac{37}{9} \div \frac{512}{18}\right]$$

$$= \frac{68}{9} - \left[\frac{37}{9} \times \frac{18}{512}\right] = \frac{68}{9} - \left[\frac{37}{256}\right]$$

$$= \frac{68}{9} - \frac{37}{256} = \frac{17408 - 333}{2304} = \frac{17075}{2304} = 7\frac{947}{2304}$$

Thus, $7\frac{5}{9} - \left[4\frac{1}{9} \div \left\{14 \times 2 - \left(2\frac{1}{18} - 2\frac{1}{2}\right)\right\}\right] = 7\frac{947}{2304}$ **Ans.**

(p) $190 - \left[35 \div 5 + \left\{8 \div \frac{1}{4} - \left(3 - \frac{1}{4}\right)\right\}\right]$

$$= 190 - \left[35 \div 5 + \left\{8 \div \frac{1}{4} - \left(\frac{12 - 1}{4}\right)\right\}\right]$$

$$= 190 - \left[35 \div 5 + \left\{8 \div \frac{1}{4} - \frac{11}{4}\right\}\right] = 190 - \left[35 \div 5 + \left\{8 \times 4 - \frac{11}{4}\right\}\right]$$

$$= 190 - \left[35 \div 5 + \left\{32 - \frac{11}{4}\right\}\right] = 190 - \left[35 \div 5 + \left\{\frac{128 - 11}{4}\right\}\right]$$

$$= 190 - \left[35 \div 5 + \frac{117}{4}\right] = 190 - \left[7 + \frac{117}{4}\right]$$

$$= 190 - \left[\frac{28 + 117}{4}\right] = 190 - \left[\frac{145}{4}\right] = 190 - \frac{145}{4}$$

$$= \frac{760 - 145}{4} = \frac{615}{4} = 153\frac{3}{4}$$

$$\text{Thus, } 190 - \left[35 \div 5 + \left\{ 8 \div \frac{1}{4} - \left(3 - \frac{1}{4} \right) \right\} \right] = 153\frac{3}{4}$$

Ans.

Multiple Choice Questions
1. (i) c,   (ii) a,   (iii) b,   (iv) d

3. Negative Numbers and Integer

Exercise 3.1
1. (a) 150 metre above sea level $= +150$ metre   **Ans.**
(b) 25°C above zero $= +25$°C   **Ans.**
(c) Loss of ₹ 600 $= -$₹600   **Ans.**
(d) 20 steps towards east $= +20$ steps   **Ans.**
(e) 36 steps towards west $= -36$ steps   **Ans.**
(f) 22°C below zero $= -22$°C   **Ans.**
(g) Gain of ₹ 1050 $= +$ ₹ 1050   **Ans.**
(h) 8 km below the sea level $= -8$ km   **Ans.**
2. (a) Opposite of gain of ₹ 215 $=$ loss of ₹ 215   **Ans.**
(b) Opposite of gaining in weight $=$ Loosing in weight   **Ans.**
(c) Opposite of go to the East $=$ Go to the West   **Ans.**
(d) Opposite of withdrawal of money from bank $=$ Deposit of money in bank   **Ans.**
(e) Opposite of increasement of temperature $=$ Decreasement of temperature   **Ans.**
(f) Opposite of 20°C above to zero $=$ 20°C below to zero   **ANs.**
(g) Opposite of going 25 km South $=$ Going 25 km North   **Ans.**
(h) Opposite of 416 before christ $=$ 416 after christ   **Ans.**
3. (a) 8 is the right side of the 4.   **Ans.**
(b) -3 is the right side of -5.   **Ans.**
(c) 0 is the right side of -4.   **Ans.**
(d) 8 is the right side of -7.   **Ans.**
4. (a) Integers between -3 and $5 = -2, -1, 0, 1, 2, 3, 4$.   **Ans.**
(b) Integers between 0 and $5 = 1, 2, 3, 4$ **Ans.**
(c) Integers between -4 and $6 = -3, -2, -1, 0, 1, 2, 3, 4, 5$ **Ans.**
(d) Integers between -5 and $-2 = -4, -3$ **Ans.**
5. (a) $15 + |-8| = 15 + 8 = 23$ Thus, $15 + |-8| = 23$ **Ans.**
(b) $|235 - 27| = 235 - 27 = 208$ Thus, $|235 - 27| = 208$ **Ans.**
(c) $18 - |-15| = 18 - |-15| = 3$ Thus, $18 - |-15| = 3$ **Ans.**

(d) $|9| + |-3| = 9 + 3 = 12$ Thus, $|9| + |-3| = 12$ **Ans.**

(e) $|-15| + |-3| = 15 + 3 = 18$ Thus, $|-15| + |-3| = 18$ **Ans.**

(f) $-|-29| = -29$ Thus, $-|-29| = -29$ **Ans.**

6. (a) $15 < 18$ (b) $0 > -8$ (c) $-4 > -5$

    (d) $-157 < 17$ (e) $-129 > -180$ (f) $-29 < 27$

7. (a) T   (b) F   (c) T   (d) F   (e) T   (f) F

    (g) T   (h) F

8. (a) Absolute value of $-24 = -(-24) = 24$ **Ans.**

    (b) Absolute value of $22 = 22$ **Ans.**

    (c) Absolute value of $-15 = (-15) = 15$ **Ans.**

    (d) Absolute value of $0 = 0$ **Ans.**

    (e) Absolute value of $-110 = -(-110) = 110$ **Ans.**

    (f) Absolute value of $115 = 115$ **Ans.**

9. (a) 4 more than 8
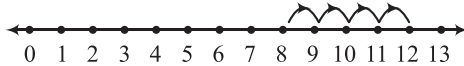
                                                         Ans.

    (b) 2 less than 6
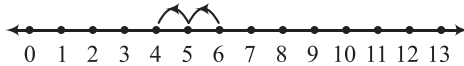
                                                        Ans.

    (c) 6 less than -4
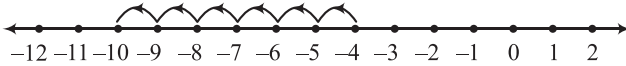
                                                        Ans.

    (d) 2 less than -5
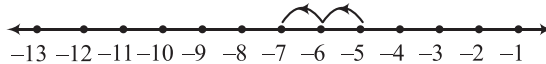
                                                        Ans.

10. (a) Descending order of $-4, -7, 8, 0, 6$ are:

       $8 > 6 > 0 > -4 > -7$ **Ans.**

    (b) Descending order of $-2, 5, -5, 1, 9$ are:

       $9 > 5 > 1 > -2 > -5$ **Ans.**

    (c) Descending order of $75, -80, -10, 0, 30$ are:

         $75 > 30 > 0 > -10 > -80$ **Ans.**

    (d) Descending order of $-91, 90, 89, -95, 105$ are:

         $105 > 90 > 89 > -91 > -95$ **Ans.**

11. (a) Ascending order of $-3, 0, -4, 1, 3$ are $-4 < -3 < 0 < 1 < 3$

                                                     Ans.

    (b) Ascending order of $4, -8, 8, -4, 5$ are $-8 < -4 < 4 < 5 < 8$

                                                     Ans.

(c) Ascending order of −10, 18, 15, −17, −5 are

$$-17 < -10 < -5 < 15 < 18$$ **Ans.**

(d) Ascending order of −70, 52, −80, 0 are $-80 < -70 < 0 < 52$

Ans.

Exercise 3.2

1. (a) Successor of $-41 = -41 + 1 = -40$ (b) Successor of $-12 = -11$

(c) Successor of $0 = 1$ (d) Successor $-109 = -108$

2. (a) $422 + (-215) + (-15) = 422 + (-215) + (-15)$

$$= 422 - 230 = 192$$

Thus, $422 + (-215) + (-15) = 192$ **Ans.**

(b) $2328 + (-186) + (-225) + 800 = 2328 - [186 + 225] + 800$

$$= 2328 - 411 + 800 = 3128 - 411 = 2717$$

Thus, $2328 + (186) + (-225) + 800 = 2717$ **Ans.**

(c) $2514 + 412 + (-108) + (-151) + 79$

$$= 2514 + 412 + 79 + (-108) + (-151) = 3005 - 259 = 2746$$

Thus, $2514 + 412 + (-108) + (-151) + 79 = 2746$ **Ans.**

(d) $2018 + (-1080) + (-2080) + 25$

$$= 2018 + 25 + (-1080) + (-2080) = 2043 - 3160 = -1117$$

Thus, $2018 + (-1080) + (-2080) + 25 = -1117$ **Ans.**

3. (a) $(+45) + (+82) = 45 + 82 = 127$

Thus, $(+45) + (+82) = 127$ **Ans.**

(b) $(+67) + (-20) = 67 - 20 = 47$

Thus, $(+67) + (-20) = 47$ **Ans.**

(c) $(-62) + (-71) = -62 - 71 = -133$

Thus, $(-62) + (-71) = -133$ **Ans.**

(d) $(-12) + (-128) = -12 - 128 = -140$

Thus, $(-12) + (-128) = -140$ **Ans.**

4. (a) $223 + (-115) = 223 - 115 = 108$

Thus, $223 + (-115) = 108$ **Ans.**

(b) $876 + (-25) = 876 - 25 = 851$

Thus, $876 + (-25) = 851$ **Ans.**

(c) $(-104) + (-412) = -104 - 412 = -516$

Thus, $(-104) + (-412) = -516$ **Ans.**

(d) $(-1620) + 8 = -1620 + 8 = -1612$

Thus, $(-1620) + 8 = -1612$ **Ans.**

(e) $6431 + (-1998) = 6431 - 1998 = 4433$

Thus, $6431 + (-1998) = 4433$ **Ans.**

(f) $2641 + (-2641) = 2641 - 2641 = 0$

Thus, $2641 + (-2641) = 0$ **Ans.**

(g) $(-4940) + 1548 + 402 = -4940 + 1950 = -2990$

Thus, $-4940 + 1548 + 402 = -2990$ **Ans.**

5. (a) $-5 + 18$

First of all we draw number line. Then we start from 0 and move 5 steps to left on number line and reach to -5. Then starting from
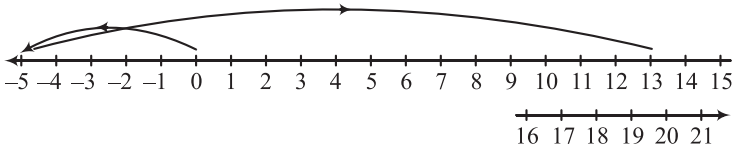
Thus, $-5 + 18 = 13$ **Ans.**

(b) $12 + 30$

First of all we draw number line. Then we start from 0 and move 12 steps to the right on number line and reach 12 and move 30 steps right to reach 42, as shown in figure.
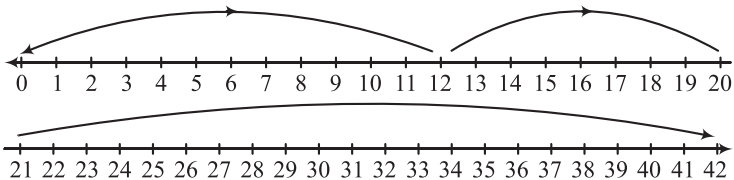
Thus, $12 + 30 = 42$ **Ans.**

(c) $(-12) + (-5)$

First all we draw number line. Then we start from 0 move 12 steps to left and reached to -12. Then we start from -12 and move further 5 steps to the left as shown in figure.
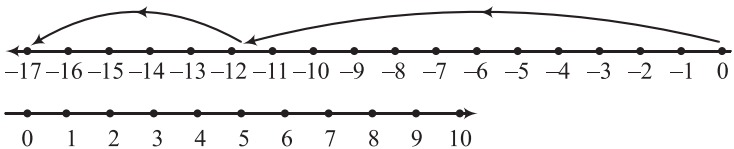
Thus, $(-12) + (-5) = -17$ **Ans.**

(d) $(-6) + 13$

First of all we draw number line. Then we start from 0 and move 13 steps to the right on number line and reach to 13.

Then starting from -13 move 6 steps to the left and reach $+7$, as shown in figure.
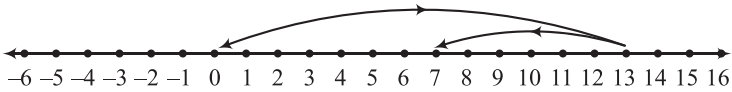
Thus, $(-6)+13=+7=7$ **Ans.**

(e) $15+(-5)$

First of all we draw number line. Than we start from 0 and move 15 steps to the right on number line and reach to $+15$. Then starting form $+15$ move 5 steps to the left and reach to $+10$, as shown in figure.
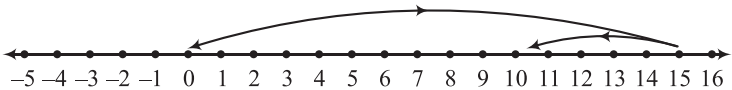
Thus, $15+(-5)=10$ **Ans.**

(f) $(-3)+14+(-5)$

First of all we draw number line. Then we start from 0 and move 3 steps to the left on number five and reach to -3. Then

Thus, $(-3)+14+(-5)=+6$ **Ans.**

6. (a) Predecessor of $0=0-1=-1$
   (b) Predecessor of $-422=-422-1=-423$
   (c) Predecessor of $23=23-1=22$
   (d) Predecessor of $4=4-1=3$
7. (a) F   (b) T   (c) T   (d) F   (e) F   (f) T
   (g) F   (h) F

Exercise 3.3

1. (a) Subtract 231 from $427=427-231=196$
   (b) Subtract 112 from $-518=-518-112=-630$
   (c) Subtract -82 from $153=153-(-82)=153+82=235$
   (d) Subtract 915 from $915=915-915=0$
   (e) Subtract -67 from $0=0-(-67)=67$
   (f) Subtract -2025 from $-1821=-1821-(-2025)$
   $=-1821+2025=204$
   (g) Subtract -28191 from $0=0-(-28191)=28191$

(h) Subtract -6525 from $-6525 = -6525 - (-6525)$
$$= -6525 + 6525 = 0$$
(i) Subtract -333 from $-333 = -333 - (-333) = -333 + 333 = 0$

2. (a) $(-25) + (-87) - (-63) + (-27)$
$$= -25 - 87 + 63 - 27 = 63 + [-25 - 87 - 27]$$
$$= 63 + [-139] = 63 - 139 = -76$$
Thus, $(-25) + (-87) - (-63) + (-27) = -76$ **Ans.**

(b) $-41 + (-18) + 65 + (-37) + (-123) + 437$
$$= 65 + 437 + [-41 + (-18) + (-37) + (-123)]$$
$$= 502 + [-41 - 18 - 37 - 123] = 502 + [-219]$$
$$= 502 - 219 = 283$$
Thus, $-41 + (-18) + 65 + (-37) + (-123) + 437 = 283$ **Ans.**

(c) $628 + (-117) + 413 + (-288)$
$$= 628 + 413 + [(-117) + (-288)]$$
$$= 1041 + [-117 - 288] = 1041 + [-405]$$
$$= 1041 - 405 = 636$$
Thus, $628 + (-117) + 413 + (-288) = 636$ **Ans.**

(d) $-29 - [(-26) + (-8) - 6]$
$$= -29 - [-26 - 8 - 6] = -29 - [-40]$$
$$= -29 + 40 = 11$$
Thus, $-29 - [(-26) + (-8) - 6] = 11$ **Ans.**

3. (a) $25 + -25 = 0$ (b) $470 - 280 = 190$
(c) $136 - 64 = 72$ (d) $(-90) + 90 = 0$
(e) $(-68) + -220 = -288$ (f) $(-227) + (-123) = -350$

4. (a) $(-5) + (-6) < (-5) - (-6)$
(b) $(-35) - (-25) > (-35) + (-25)$
(c) $(-22) - (+38) < (+39) - (+62)$
(d) $(-15) + (-15) < (+15) + (+30)$
(e) $(-121) + 181 < (-60) + 130$
(f) $(-35) + (-44) < (+15) + (-30)$

5. The point of maximum depth $= -22800$ metre below the sea level
The point of mountain $= 19846$ metre above the sea level
So, The total depth distance = above the sea level − below the sea level
$[19846 - (-22800)]$ metre $= (19846 + 22800)$ metre $= 42646$ meter
Thus, the vertical distance $= 42646$ metre **Ans.**

6. The temperature at 12 pm $= 29°C$ greater than zero
But at midnight on that day $= -4°C$ less than zero.
So, the difference between both time
$$= 29°C - (-4°C)$$
$$= 29°C + 4°C = 33°C$$
Thus, the difference $= 33°C$ **Ans.**

7. Sum of 284 and $-140 = 284 + (-140) = 284 - 140 = 144$
Then, subtract -81 from the sum of 284 and -140
$$= 144 - (-81)$$
$$= 144 + 81 = 225$$
Thus, 225 is get. **Ans.**

8. The sum of two integers $= 272$
The one of them $= -113$
Let, the second of them $= x$
So, one integer + second integer $= 272$
Put the value of one integers
$$(-113) + x = 272$$
$$x = 272 + 113$$
$$x = 385$$
Thus, the second integer $= 385$ **Ans.**

9. Subtract -36 from the sum of 384 and -240
Sum of 384 and $-240 = 384 + (-240) = 384 - 240 = 144$
Then, subtract -36 from the sum of -384
and $= 144 - (-36)$
$$= 144 + 36 = 180$$
Thus, 180 is get **Ans.**

10. The sum of two integers $= -2186$
The one of them $= 940$
Let, the second integer $= x$
So, the first integer + the second integer $= -2186$
$940 + x = -2186$
or $x = -2186 - 940$
or $x = -3126$
Thus, -3126 is the second integer. **Ans.**

Exercise 3.4

1. (a) $(3+5) \times 6 = 8 \times 6 = 48$ and $3 + (5 \times 6) = 3 + 30 = 33$

   $\because \qquad 48 > 33$

   Thus, $(3+5) \times 6$ is greater integer. **Ans.**

   (b) $(9-4) \times 7 = 5 \times 7 = 35$ and $9 + (-4) \times 7 = 9 - 28 = -19$

   $\because \qquad 35 > -19$

   Thus, $(9-4) \times 7$ is greater integer. **Ans.**

   (c) $[(-5)-6] \times (-8) = (-11) \times (-8) = 88$ and

   $(-5) - 6 \times (-8) = -5 + 48 = 43$

   $\because 88 > 43$

   Thus, $[(-5)-6] \times (-8)$ is greater. **Ans.**

2. (a) $1372 \times 425 - 1372 \times 425 = 583100 - 583100 = 0$

   Thus, $1372 \times 425 - 1372 \times 425 = 0$ **Ans.**

   (b) $(-286) \times (-58) + (-286) \times (-42)$

   $\qquad = (-286 \times -58) + (-286 \times -42)$

   $\qquad = 16588 + 12012 = 16588 + 12012 = 28600$

   Thus, $(-286) \times (-58) + (-286) \times (-42) = 28600$ **Ans.**

   (c) $18685 \times 99 - (-18685) = 1849815 + 18685 = 1868500$

   Thus, $18685 \times 99 - (-18685) = 1868500$ **Ans.**

   (d) $15341 \times (112) - (-15341) \times 88 = 1718192 + 1350008$

   $\qquad = 3068200$

   Thus, $15341 \times (112) - (-15341) \times 88 = 3068200$ **Ans.**

   (e) $(-8) \times [10-5-43+98] = -8 \times [10+98-5-43]$

   $\qquad = -8 \times [108-48] = -8 \times 60 = -480$

   Thus, $(-8) \times [10-5-43+98] = -480$ **Ans.**

   (f) $38921 \times (-13) + (-38921) \times 87$

   $\qquad = -505973 - 3386127 = -3892100$

   Thus, $38921 \times (-13) + (-38921) \times 87 = -3892100$ **Ans.**

3. (a) -139 multiply by $(-1) = -139 \times (-1) = 139$

   Thus, $-139 \times (-1) = 139$ **Ans.**

   (b) 152 multiply by $(-1) = 152 \times (-1) = -152$

   Thus, $152 \times (-1) = -152$ **Ans.**

   (c) -372 multiply by $(-1) = -372 \times (-1) = 372$

   Thus, $-372 \times (-1) = 372$ **Ans.**

   (d) 0 multiply by $(-1) = 0 \times (-1) = 0$

   Thus, $0 \times (-1) = 0$ **Ans.**

4. (a) $4 \times (-25) = -100$ $\qquad$ Thus, $4 \times (-25) = -100$ **Ans.**

(b) $(-125) \times 8 = -125 \times 8 = -1000$

    Thus, $(-125) \times 8 = -1000$ **Ans.**

(c) $(-14) \times (-16) = -14 \times (-16) = 224$

    Thus, $(-14) \times (-16) = 224$ **Ans.**

(d) $4 \times (-5) \times 8 = 4 \times 8 \times (-5) = 32 \times (-5) = -160$

    Thus, $4 \times (-5) \times 8 = -160$ **Ans.**

(e) $18 \times (-6) \times (-5) = 18 \times 30 = 540$

    Thus, $18 \times (-6) \times (-5) = 540$ **Ans.**

(f) $(-120) \times (-20) \times (-20) = -120 \times (-20) \times (-20)$
$$= -120 \times 400 = -48000$$

    Thus, $(-120) \times (-20) \times (-20) = -48000$ **Ans.**

(g) $(-22) \times 5 \times (-40) = 5 \times (-22) \times (-40) = 5 \times 880 = 4400$

    Thus, $(-22) \times 5 \times (-40) = 4400$ **Ans.**

(h) $(-27) \times 60 \times 0 = -27 \times 60 \times 0 = -27 \times 0 = 0$

    Thus, $(-27) \times 60 \times 0 = 0$ **Ans.**

(i)$(-2) \times (-4) \times (-1) \times (-8) = -2 \times (-4) \times 8 = 8 \times 8 = 64$

    Thus, $(-2) \times (-4) \times (-1) \times (-8) = 64$ **Ans.**

5. (a) T   (b) T   (c) F   (d) T   (e) F   (f) T

Exercise 3.5

1. (a) $496 \div 496 = 1$ (b) $-6025 \div -1 = 6025$

    (c) $0 \div 439 = 0$ (d) $-656 \div 328 = -2$

    (e) $-967 \div 967 = -1$ (f) $1205 \div 1205 = 1$

2. (a) F   (b) F   (c) F   (d) T   (e) F   (f) T

3. (a) $81 \div (-3) = \dfrac{81}{-3} = -27$ Thus, $81 \div (-3) = -27$ **Ans.**

    (b) $(-64) \div 8 = \dfrac{-64}{8} = -8$ Thus, $(-64) \div 8 = -8$ **Ans.**

    (c) $(-91) \div (-13) = \dfrac{-91}{-13} = 7$ Thus, $(-91) \div (-13) = 7$ **Ans.**

    (d) $36 \div (-9) = \dfrac{36}{-9} = -4$ Thus, $36 \div (-9) = -4$ **Ans.**

    (e) $(-136) \div 17 = \dfrac{-136}{17} = -8$ Thus, $(-136) \div 17 = -8$ **Ans.**

    (f) $0 \div (-16) = \dfrac{0}{-16} = 0$ Thus, $0 \div (-16) = 0$ **Ans.**

    (g) $(-1728) \div 12 = \dfrac{-1728}{12} = -144$

Thus, $(-1728) \div 12 = -144$ **Ans.**

(h) $(-15625) \div 125 = \dfrac{-15625}{125} = -125$

Thus, $(-15625) \div 125 = -125$ **Ans.**

(i) $(-4096) \div (-8) = \dfrac{-4096}{-8} = 512$

Thus, $(-4096) \div (-8) = 512$ **Ans.**

(j) $2039 \div 1 = \dfrac{2039}{1} = 2039$ \qquad Thus, $2039 \div 1 = 2039$

Ans.

(k) $4000 \div (-1000) = \dfrac{4000}{-1000} = -4$

Thus, $4000 \div (-1000) = -4$ **Ans.**

(l) $41326 \div (-41326) = \dfrac{41326}{-41326} = -1$

Thus, $41326 \div (-41326) = -1$ **Ans.**

Exercise 3.6

1. (a) $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 = 7^7$ **Ans.**

(b) $(-9) \times (-9) \times (-9) \times (-9) \times (-9) \times (-9) \times (-9) \times (-9) = (-9)^8$

Ans.

(c) $1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 = (1.1)^{10}$ **Ans.**

(d) $(-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5)$
$= (-5)^9$ **Ans.**

2. (a) $3^4 \Rightarrow$ base $= 3$, exponent $= 4$ **Ans.**

(b) $5^6 \Rightarrow$ base $= 5$, exponent $= 6$ **Ans.**

(c) $(-8)^5 \Rightarrow$ base $= -8$, exponent $= 5$ **Ans.**

(d) $(-41)^2 \Rightarrow$ base $= -41$, exponent $= 2$ **Ans.**

(e) $81^7 \Rightarrow$ base $= 81$, exponent $= 7$ **Ans.**

(f) $(-200)^6 \Rightarrow$ base $= -200$, exponent $= 6$ **Ans.**

3. (a) $2^4 \times 2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 1024$

Thus, $2^4 \times 2^6 = 1024$ **Ans.**

(b) $(-2)^3 \times (-3)^4$
$= (-2) \times (-2) \times (-2) \times (-3) \times (-3) \times (-3) \times (-3) = -648$
Thus, $(-2)^3 \times (-3)^4 = -648$ **Ans.**

(c) $(-11)^4 \times (-2)^6$
$= (-11) \times (-11) \times (-11) \times (-11) \times (-2) \times (-2) \times (-2)$

$$\times (-2) \times (-2) \times (-2) = 937024$$
Thus, $(-11)^4 \times (-2)^6 = 937024$ **Ans.**

(d) $(-4)^3 \times 2^2 \times (-5)^3$

$= (-4) \times (-4) \times (-4) \times 2 \times 2 \times (-5) \times (-5) \times (-5) = 32000$
Thus, $(-4)^3 \times 2^2 \times (-5)^3 = 32000$ **Ans.**

(e) $(-6)^4 \times (-7)^8 \times (-1)^{96}$

$= (-6) \times (-6) \times (-6) \times (-6) \times (-7) \times (-7) \times (-7) \times (-7) \times (-7)$
$\times (-7) \times (-7) \times (-7) \times (-1)^{96} = 1296 \times 5764801 \times (-1)^{96}$

$= 7471182096 \times (1)$ $\qquad$ [$\because$ 96 is an even integer]

$= 7471182096 \times 1 = 7471182096$
Thus, $(-6)^4 \times (-7)^8 \times (-1)^{96} = 7171182096$ **Ans.**

(f) $(-2)^4 \times (-2)^5 \times (-2)^7$

$= (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2)$
$\times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) = 65536$
Thus, $(-2)^4 \times (-2)^5 \times (-2)^7 = 65536$ **Ans.**

4. (a) $4^6 = 4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4096$

Thus, $4^6 = 4096$ **Ans.**

(b) $(-2)^8 = (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2)$
$= 256$

Thus, $(-2)^8 = 256$ **Ans.**

(c) $(-5)^6 = (-5) \times (-5) \times (-5) \times (-5) \times (-5) \times (-5) = 15625$

Thus, $(-5)^6 = 15625$ **Ans.**

(d) $8^3 = 8 \times 8 \times 8 = 512$

Thus, $8^3 = 512$ **Ans.**

(e) $(-11)^3 = (-11) \times (-11) \times (-11) = -1331$

Thus, $(-11)^3 = -1331$ **Ans.**

(f) $12^3 = 12 \times 12 \times 12 = 1728$

Thus, $(12)^3 = 1728$ **Ans.**

(g) $10^4 = 10 \times 10 \times 10 \times 10 = 10000$

Thus, $10^4 = 10000$ **Ans.**

(h) $(-40)^3 = (-40) \times (-40) \times (-40) = -64000$

Thus, $(-40)^3 = -64000$ **Ans.**

(i) $(-1)^{99} = -1$ $\qquad$ [$\because$ 99 is an odd integer]

Thus, $(-1)^{99} = -1$ **Ans.**

(j) $(-1)^{102} = 1$　　　[∵ 102 is an even integer]

　　Thus, $(-1)^{102} = 1$　　　　　　　　　　　　　　　**Ans.**

(k) $(-1)^{90} = -1$　　　[∵ 90 is an even integer]

　　Thus, $(-1)^{90} = 1$　　　　　　　　　　　　　　　**Ans.**

(l) $(-1)^{98} = 1$　　　[∵ 98 is an even integer]

　　Thus, $(-1)^{98} = 1$　　　　　　　　　　　　　　　**Ans.**

5. (a) F　　　(b) T　　　(c) F　　　(d) F　　　(e) T　　　(f) T

6. (a) $(-8)^6 \times (-8)^5 = (-8)^{11}$

　　Left hand side is taken $= (-8)^6 \times (-8)^5 = (-8)^{6+5} = (-8)^{11}$

　　Right hand side is taken $= (-8)^{11}$

　　Hence, the both sides are equal.

(b) $3^{15} \times 3^2 = 3^{17}$

　　Left hand side is taken, $3^{15} \times 3^2 = (3)^{15+2} = 3^{17}$

　　Right hand side is taken, 3^{17}

　　$(3)^{17} = 3^{17}$

　　Hence, both sides are equal.

(c) $(-5)^8 \div (-5)^3 = (-5)^5$

　　Left hand side is taken, $= (-5)^8 \div (-5)^3 = \dfrac{(-5)^8}{(-5)^3} = (-5)^{8-3}$

$$= (-5)^5$$

　　Right hand side is taken, $(-5)^5$

　　$(-5)^5 = (-5)^5$

　　Hence, the both sides are equal.

(d) $2^7 \div 2^4 = 2^3$

　　Left hand side is taken, $= 2^7 \div 2^4 = \dfrac{2^7}{2^4} = (2)^{7-4} = 2^3$

　　Right hand side is taken, 2^3

　　$2^3 = 2^3$

　　Hence, the both sides are equal.

7. $(1)^2 = 1,$　　$(2)^2 = 4,$　　$(3)^2 = 9,$　　$(4)^2 = 16,$　$(5)^2 = 25,$

　　$(6)^2 = 36,$　$(7)^2 = 49,$　$(8)^2 = 64,$　$(9)^2 = 81,$　$(10)^2 = 100$

8. $(-3)^x = -243$ or $(-3)^x = (-3)^5$

　　Comparing both sides power

$\therefore$ $x = 5$

Hence, the power (-3) is 5.   **Ans.**

9. $(2)^x = 128$ or $(2)^x = (2)^7 \therefore x = 7$

Hence, the power 2 is 7.   **Ans.**

10. $(1)^3 = 1,$ $(2)^3 = 8,$ $(3)^3 = 27,$ $(4)^3 = 64,$ $(5)^3 = 125,$
    $(6)^3 = 216, (7)^3 = 343,$ $(8)^3 = 512, (9)^3 = 729, (10)^3 = 1000$ **Ans.**

Multiple Choice Questions

(i) b   (ii) b   (iii) b   (iv) d   (v) b   (vi) a

4. Playing with Numbers

Exercise 4.1

1. (a) Expression of 22 in sum of odd number are $22 = 1 + 21;$
    $22 = 3 + 19; 22 = 5 + 17; 22 = 7 + 15; 22 = 9 + 13$
    and $22 = 11 + 11.$ **Ans.**

(b) Expression of 76 in sum of odd number are $76 = 1 + 75,$
    $76 = 3 + 73, 76 = 5 + 71, 76 = 7 + 69, 76 = 9 + 67,$
    $76 = 11 + 65, 76 = 13 + 63, 76 = 15 + 61, 76 = 17 + 59,$
    $76 = 19 + 57, 76 = 21 + 55, 76 = 23 + 53, 76 = 25 + 51,$
    $76 = 27 + 49, 76 = 29 + 47, 76 = 31 + 45, 76 = 33 + 43,$
    $76 = 35 + 41$ and $76 = 37 + 39.$ **Ans.**

(c) Expression of 46 in sum of odd number are $46 = 1 + 45,$
    $46 = 3 + 43, 46 = 5 + 41, 46 = 7 + 39, 76 = 9 + 37,$
    $46 = 11 + 35, 46 = 13 + 33, 46 = 15 + 31, 46 = 17 + 29,$
    $46 = 19 + 27, 46 = 21 + 25$ and $46 = 23 + 23.$ **Ans.**

(d) Expression of 184 in sum of odd number are $1 + 183, 3 + 181,$
    $5 + 179, 7 + 177, 9 + 175, 11 + 173, 13 + 171, 15 + 169, 17 + 167,$
    $19 + 165, 21 + 163, 23 + 161, 25 + 159, 27 + 157, 29 + 155,$
    $31 + 153, 33 + 151, 35 + 149, 37 + 147, 39 + 145, 41 + 143,$
    $43 + 141, 45 + 139, 47 + 137, 49 + 135, 51 + 133, 53 + 131,$
    $55 + 129, 57 + 127, 59 + 125, 61 + 123, 63 + 121, 65 + 119,$
    $67 + 117, 69 + 115, 71 + 113, 73 + 111, 75 + 109, 77 + 107,$
    $79 + 105, 81 + 103, 83 + 101, 85 + 99, 87 + 97, 89 + 95, 91 + 93.$ **Ans.**

2. (a) $2 =$ Prime number   (b) $19 =$ Prime number
    (c) $23 =$ Prime number   (d) $17 =$ Prime number
    (e) $39 =$ not a prime number   (f) $37 =$ Prime number
    Thus, (a), (b), (c), (d) and (f) are prime numbers.

3. (a) All the factors of $35 = 1, 5, 7, 35$ **Ans.**
   (b) All the factors of $86 = 1, 2, 43, 86$ **Ans.**
   (c) All the factors of $240 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20,$
       $24, 30, 40, 48, 60, 80, 120, 240$ **Ans.**
   (d) All the factors of $56 = 1, 2, 4, 7, 8, 14, 28, 56$ **Ans.**
   (e) All the factors of $169 = 1, 13, 169$ **Ans.**
   (f) All the factors of $125 = 1, 5, 25, 125$ **Ans.**
4. (a) $32 = 3 + 29$ and $32 = 13 + 19$ **Ans.**
   (b) $70 = 3 + 67, 70 = 11 + 59, 70 = 17 + 53, 70 = 23 + 47,$
       $70 = 29 + 41$ **Ans.**
   (c) $126 = 13 + 113, 126 = 17 + 109, 126 = 19 + 107, 126 = 23 + 103,$
       $126 = 29 + 97, 126 = 37 + 89, 126 = 43 + 83, 126 = 47 + 79,$
       $126 = 53 + 73, 126 = 59 + 67$ **Ans.**
5. (a) 1 to 30
       Prime numbers between 1 and $30 = 2, 3, 5, 7, 11, 13, 17, 19,$
       $23, 29.$ **Ans.**
   (b) 30 to 60
       Prime numbers between 30 and $60 = 31, 37, 41, 43, 47, 53, 59.$
                                                                    Ans.
   (c) 40 to 70
       Prime numbers between 40 and $70 = 41, 43, 47, 53, 59, 61, 67.$
                                                                    Ans.
   (d) 85 to 100
       Prime numbers between 85 and $100 = 89, 97.$ **Ans.**
   (e) 110 to 130
       Prime number between 110 and $130 = 113, 127, 129.$
   (f) 120 to 150
       Prime numbers between 120 and $150 = 127, 129, 131,$
       $137, 139, 149.$
6. (a) First five multiples of 14 are: 14, 28, 42, 56, 70
   (b) First five multiples of 19 are: 19, 38, 57, 76, 95
   (c) First five multiples of 17 are : 17, 34, 51, 68, 85
   (d) First five multiples of 56 are: 56, 112, 168, 224, 280
   (e) First five multiples of 169 are: 169, 338, 507, 676, 845
   (f) First five multiples of 125 are: 125, 250, 375, 500, 625

Exercise 4.2

1. (a) $44255 \div 5 = \dfrac{44255}{5} = 8851$ **Ans.** (b) $27240 \div 5 = \dfrac{27240}{5} = 5448$

(c) $9273 \div 5 = \dfrac{9273}{5} = 1854.6$ (d) $152685 \div 5 = \dfrac{152685}{5} = 30537$

(e) $82640 \div 5 = \dfrac{82640}{5} = 16528$

(f) $425652 \div 5 = \dfrac{425652}{5} = 85130.4$

Thus, (a), (b), (d), (e) are divisible by 5.   **Ans.**

2. (a) $15248 \div 4 = \dfrac{15248}{4} = 3812$ (b) $24431 \div 4 = \dfrac{24431}{4} = 6107.75$

(c) $1600 \div 4 = \dfrac{1600}{4} = 400$ (d) $85661 \div 4 = \dfrac{85661}{4} = 21415.25$

(e) $37255 \div 4 = \dfrac{37255}{4} = 9313.75$ (f) $83500 \div 4 = \dfrac{83500}{4} = 20875$

Thus, (a), (c), (f) are divisible by 4.   **Ans.**

3. (a) $4371 \div 3 = \dfrac{4371}{3} = 1457$ (b) $1603 \div 3 = \dfrac{1603}{3} = 534.33$

(c) $40391 \div 3 = \dfrac{40391}{3} = 13463.66$ (d) $25433 \div 3 = \dfrac{25433}{3} = 8477.66$

(e) $347541 \div 3 = \dfrac{347541}{3} = 115847$

(f) $108537 \div 3 = \dfrac{108537}{3} = 36179$

Thus, (a), (e), (f) are divisible by 3.   **Ans.**

4. (a) $4338 \div 6 = \dfrac{4338}{6} = 723$ (b) $15243 \div 6 = \dfrac{15243}{6} = 2540.5$

(c) $4712 \div 6 = \dfrac{4712}{6} = 785.33$ (d) $25252 \div 6 = \dfrac{25252}{6} = 4208.66$

(e) $45875 \div 6 = \dfrac{45875}{6} = 7645.83$ (f) $15512 \div 6 = \dfrac{15512}{6} = 2585.33$

Thus, (a) is divisible by 6.   **Ans.**

5. (a) $942 \div 2 = \dfrac{942}{2} = 471$ (b) $1343 \div 2 = \dfrac{1343}{2} = 671.5$

(c) $15280 \div 2 = \dfrac{15280}{2} = 7640$ (d) $187646 \div 2 = \dfrac{187646}{2} = 93823$

(e) $888625 \div 2 = \dfrac{888625}{2} = 444312.5$

(f) $5438468 \div 2 = \dfrac{5438468}{2} = 2719234$

Thus, (a), (c), (d), (f) are divisible by 2. **Ans.**

6. (a) F   (b) F   (c) F   (d) F   (e) T   (f) T

7. (a) $1665 \div 7 = \dfrac{1665}{7} = 237.85$ (b) $5272 \div 7 = \dfrac{5272}{7} = 753.14$

(c) $3024 \div 7 = \dfrac{3024}{7} = 432$ (d) $4880 \div 7 = \dfrac{4880}{7} = 697.14$

(e) $89743 \div 7 = \dfrac{89743}{7} = 12820.42$

(f) $34917 \div 7 = \dfrac{37917}{7} = 4988.14$

Thus, (c) is divisible by 7. **Ans.**

8. (a) 249 is not prime number   (b) 125 is not prime number
(c) 197 is a prime number   (d) 263 is a prime number
(e) 143 is a not prime number   (f) 277 is prime number
(g) 251 is a prime number   (h) 361 in not prime number

9. (a) $6150 \div 10 = \dfrac{6150}{10} = 615$ (b) $8230 \div 10 = \dfrac{8230}{10} = 823$

(c) $14892 \div 10 = \dfrac{14892}{10} = 1489.2$ (d) $63100 \div 10 = \dfrac{63100}{10} = 6310$

(e) $72081 \div 10 = \dfrac{72081}{10} = 7208.1$ (f) $90008 \div 10 = \dfrac{90008}{10} = 9000.8$

Thus, (a), (b), (d) are divisible by 10. **Ans.**

10. (a) $1809 \div 9 = \dfrac{1809}{9} = 201$ (b) $2305 \div 9 = \dfrac{2305}{9} = 256.111$

(c) $54234 \div 9 = \dfrac{54234}{9} = 6026$

(d) $423452 \div 9 = \dfrac{423452}{9} = 47050.22$

(e) $82573 \div 9 = \dfrac{82573}{9} = 9174.77$

(f) $15847 \div 9 = \dfrac{15874}{9} = 1760.77$

Thus, (a), (c) are divisible by 9. **Ans.**

11. (a) $992 \div 8 = \dfrac{992}{8} = 124$

(b) $7448 \div 8 = \dfrac{7448}{8} = 931$

(c) $5000 \div 8 = \dfrac{5000}{8} = 625$

(d) $84653 \div 8 = \dfrac{84653}{8} = 10581.625$

(e) $42344 \div 8 = \dfrac{42344}{8} = 5293$

(f) $85518 \div 8 = \dfrac{85518}{8} = 10689.75$

Thus, (a), (b), (c), (e) are divisible by 8. **Ans.**

12. (a) $407 \div 11 = \dfrac{407}{11} = 37$ (b) $8245 \div 11 = \dfrac{8245}{11} = 749.54$

(c) $4950 \div 11 = \dfrac{4950}{11} = 450$ (d) $43574 \div 11 = \dfrac{43574}{11} = 3961.27$

(e) $22456 \div 11 = \dfrac{22456}{11} = 2041.45$

(f) $107789 \div 11 = \dfrac{107789}{11} = 9799$

Thus, (a), (c), (f) are divisible by 11. **Ans.**

Exercise 4.3

1. (a) 9

3	9
3	3
	1

Thus, $9 = 3 \times 3$ **Ans.**

2	156
2	78
3	39
13	13
	1

Thus, $156 = 2 \times 2 \times 3 \times 13$ **Ans.**

(b) 48

2	48
2	24
2	12
2	6
3	3
	1

Thus, $48 = 2 \times 2 \times 2 \times 2 \times 3$ **Ans.**

(c) 156

(d) 144

2	144
2	72
2	36
2	18
3	9
3	3
	1

Thus,
$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$ **Ans.**

(e) 60

2	60
2	30
3	15
5	5
	1

Thus, $60 = 2 \times 2 \times 3 \times 5$ **Ans.**

(f) 270

2	270
3	135
3	45
3	15
5	5
	1

Thus, $270 = 2 \times 3 \times 3 \times 3 \times 5$ **Ans.**

(g) 250

2	250
5	125
5	25
5	5
	1

Thus, $250 = 2 \times 5 \times 5 \times 5$ **Ans.**

(h) 125

5	125
5	25
5	5
	1

Thus, $125 = 5 \times 5 \times 5$ **Ans.**

(i) 444

2	444
2	222
3	111
37	37
	1

Thus, $444 = 2 \times 2 \times 3 \times 37$ **Ans.**

(j) 763

7	763
109	109
	1

Thus, $763 = 7 \times 109$ **Ans.**

(k) 1904

2	1904
2	952
2	476
2	238
7	119
17	17
	1

Thus,
$1904 = 2 \times 2 \times 2 \times 2 \times 7 \times 17$

Ans.

(l) 17630

2	17630
5	8815
1763	1763
	1

Thus, $17630 = 2 \times 5 \times 1763$

Ans.

2. Smallest 3-digit number
$= 100$

Greatest 3-digit number $= 999$

Prime factors

3	999
3	333
3	111
37	37
	1

Thus,

$999 = 3 \times 3 \times 3 \times 37$ **Ans.**

Prime factors

2	100
2	50
5	25
5	5
	1

Thus, $100 = 2 \times 2 \times 5 \times 5$

Ans.

3. Smallest 5-digit number $= 10000$

Prime factor

2	10000
2	5000
2	2500
2	1250
5	625
5	125
5	25
5	5
	1

Thus, $10000 = 2 \times 2 \times 2$

$\times 2 \times 5 \times 5 \times 5 \times 5$ **Ans.**

Exercise 4.4

1. (a) 306, 630

$$306 \overline{\smash{)}630}(2$$
$$\underline{-612}$$
$$18\overline{\smash{)}306}(17$$
$$\underline{-18}$$
$$126$$
$$\underline{-126}$$
$$0$$

Thus, required H.C.F. $= 18$ **Ans.**

(b) 513, 1134

$$513\overline{\smash{)}1134}(2$$
$$\underline{-1026}$$
$$108\overline{\smash{)}513}(4$$
$$\underline{-432}$$
$$81\overline{\smash{)}108}(1$$
$$\underline{-81}$$
$$27\overline{\smash{)}81}(3$$
$$\underline{-81}$$
$$0$$

Thus, required H.C.F. $= 27$ **Ans.**

(c) 437, 1288

$$437\overline{\smash{)}1288}(2$$
$$\underline{-874}$$
$$414\overline{\smash{)}437}(1$$
$$\underline{-414}$$
$$23\overline{\smash{)}414}(18$$
$$\underline{-23}$$
$$184$$
$$\underline{-184}$$
$$0$$

Thus, required H.C.F. $= 23$ **Ans.**

(d) 217, 385, 735

First of all, we find the H.C.F. of 385 and 735

```
           385 ) 7 3 5 ( 1
                 −3 8 5
             3 5 0 ) 3 8 5 ( 1
                     −3 5 0
                   3 5 ) 3 5 0 ( 10
                        −3 5 0
                            0
```

Because 35 is the H.C.F. of 385 and 735.

Now, we find the H.C.F. of 35 and 217.

```
           35 ) 2 1 7 ( 6
                −2 1 0
                7 ) 3 5 ( 5
                   −3 5
                      0
```

Thus, H.C.F. of 217, 385 and 735 = 7 **Ans.**

(e) 671, 781, 1441

First of all, we find the H.C.F. of 781 and 1441

```
        781 ) 1 4 4 1 ( 1
              −7 8 1
           6 6 0 ) 7 8 1 ( 1
                   −6 6 0
                 1 2 1 ) 6 6 0 ( 5
                         −6 0 5
                       5 5 ) 1 2 1 ( 2
                            −1 1 0
                          1 1 ) 5 5 ( 5
                               −5 5
                                  0
```

Because 11 is the H.C.F. of 781 and 1441.

Now, we find the
H.C.F. of 11 and 671.

```
        11 ) 6 7 1 ( 61
             −6 6
               1 1
               1 1
                ×
```

Thus, H.C.F. of 671,
781 and 1441 = 11 **Ans.**

Progress With Maths-6

(f) 2052, 3996, 7344

First of all we find the H.C.F. of 3996 and 7344.

$$3996 \overline{)\,7\,3\,4\,4\,}\,(1$$
$$\underline{-3\,9\,9\,6}$$
$$3\,3\,4\,8\,\overline{)\,3\,9\,9\,6\,}\,(1$$
$$\underline{-3\,3\,4\,8}$$
$$6\,4\,8\,\overline{)\,3\,3\,4\,8\,}\,(5$$
$$\underline{-3\,2\,4\,0}$$
$$1\,0\,8\,\overline{)\,6\,4\,8\,}\,(6$$
$$\underline{-6\,4\,8}$$
$$0$$

Because 108 is the H.C.F. of 3996 and 7344

Now, we find the H.C.F. of 108 and 2052.

$$108 \overline{)\,2\,0\,5\,2\,}\,(19$$
$$\underline{-1\,0\,8}$$
$$9\,7\,2$$
$$\underline{-9\,7\,2}$$
$$0$$

Thus, H.C.F. of 2052, 3996 and 7344 $=108$ **Ans.**

2. (a) 360, 192

2	360
2	180
2	90
3	45
3	15
5	5
	1

2	192
2	96
2	48
2	24
2	12
2	6
3	3
	1

$\because 360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$

$192 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$

Here common factors $= 2 \times 2 \times 2 \times 3 = 24$

Thus, H.C.F. of 360 and 192 $= 24$ **Ans.**

(b) 288, 198

2	288
2	144
2	72
2	36
2	18
3	9
3	3
	1

2	198
3	99
3	33
11	11
	1

$\therefore \qquad 288 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$

$198 = 2 \times 3 \times 3 \times 11$

Here common factors $= 2 \times 3 \times 3 = 18$

Thus, H.C.F. of 288 and 198 $= 18$ **Ans.**

(c) 1490, 540

2	1490
5	745
149	149
	1

2	540
2	270
3	135
3	45
3	15
5	5
	1

$\therefore \qquad 1490 = 2 \times 5 \times 149$

$540 = 2 \times 2 \times 3 \times 3 \times 3 \times 5$

Here common factors $= 2 \times 5 = 10$

Thus, H.C.F. of 1490 and 540 $= 10$ **Ans.**

(d) 216, 288, 180

2	216
2	108
2	54
3	27
3	9
3	3
	1

2	288
2	144
2	72
2	36
2	18
3	9
3	3
	1

2	180
2	90
3	45
3	15
5	5
	1

Progress With Maths-6

$\because \qquad 216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$
$\qquad\qquad 288 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$
$\qquad$ and $180 = 2 \times 2 \times 3 \times 3 \times 5$

Here, common factors $= 2 \times 2 \times 3 \times 3 = 36$

Thus, H.C.F. of 216, 288 and $180 = 36$ **Ans.**

(e) 201, 573, 2079

3	201
67	67
	1

3	573
191	191
	1

3	2079
3	693
11	231
21	21
	1

$\because \qquad\qquad\qquad 201 = 3 \times 67$
$\qquad\qquad\qquad\quad 573 = 3 \times 191$
$\qquad\qquad\qquad 2079 = 3 \times 3 \times 11 \times 21$

Here, common factors $= 3$

Thus, H.C.F. of 201, 573 and $2079 = 3$ **Ans.**

(f) 125, 6125, 15625

5	125
5	25
5	5
	1

5	6125
5	1225
5	245
7	49
7	7
	1

5	15625
5	3125
5	625
5	125
5	25
5	5
	1

$\because \qquad\qquad 125 = 5 \times 5 \times 5$
$\qquad\qquad 6125 = 5 \times 5 \times 5 \times 7 \times 7$
$\qquad\quad 15625 = 5 \times 5 \times 5 \times 5 \times 5 \times 5$

Here common factors $= 5 \times 5 \times 5 = 125$

Thus, H.C.F. of 125, 6125 and $15625 = 125$ **Ans.**

3. Even, because even numbers have their even H.C.F. **Ans.**

4. The H.C.F. of two prime number will be 1. **Ans.**

5. The H.C.F. of two successive even numbers will be 2. **Ans.**

6. The floor of room $= 9$ m $\times$ 4.75 m or 900 cm $\times$ 475 cm

So, we find size of square tiles, we have to find the H.C.F. of 900 and 475.

$$475 \overline{)\,900\,}(\,1$$
$$\underline{-475}$$
$$425\overline{)\,475\,}(\,1$$
$$\underline{-425}$$
$$50\overline{)\,425\,}(\,8$$
$$\underline{-400}$$
$$25\overline{)\,50\,}(\,2$$
$$\underline{-50}$$
$$0$$

So, the size of one marble tile $= 25$ cm.

Area of floor $= (900 \text{ cm} \times 475 \text{ cm}) = 427500 \text{ cm}^2$

Then, the area of the one tile $= 25 \text{ cm} \times 25 \text{ cm} = 625 \text{ cm}^2$

So, the required tiles $= \dfrac{\text{Area of floor}}{\text{Area of one tile}} = \dfrac{427500 \text{ cm}^2}{625 \text{ cm}^2} = 684$

Thus, the required tiles $= 684$ **Ans.**

7. Clearly, we must find the greatest number, which divides $(98 - 2)$, $(118 - 6)$ and $(218 - 10)$. So, which completely divides the 96, 112 and 208.
First of all, we find the H.C.F. of 96 and 112.

$$96\overline{)\,112\,}(\,1$$
$$\underline{-96}$$
$$16\overline{)\,96\,}(\,6$$
$$\underline{-96}$$
$$0$$

Now, we find the H.C.F. of 16 and 208.

$$\begin{array}{r} 13 \\ 16\overline{)\,208} \\ \underline{-16\downarrow} \\ 48 \\ \underline{-48} \\ 0 \end{array}$$

Thus, the required number $= 16$ **Ans.**

8. Clearly, we must find the greatest number, which divides $(250-2)$ and $(188-2)$., So which completely divides the 248 and 186.

First of all we find the H.C.F. of 248 and 186.

$$
\begin{array}{r}
186\overline{)\,248\,}(1 \\
-186 \\
\hline
62\overline{)\,186\,}(3 \\
-186 \\
\hline
0
\end{array}
$$

Thus, the required number $=62$ **Ans.**

9. Clearly, we must find the greatest number, which $(280-4)$, $(351-3)$ and $(449-5)$. So which completely divides the 276, 348 and 444.

First of all we find the H.C.F. of 276 and 348.

$$
\begin{array}{r}
276\overline{)\,348\,}(1 \\
-276 \\
\hline
72\overline{)\,276\,}(3 \\
-216 \\
\hline
60\overline{)\,72\,}(1 \\
-60 \\
\hline
12\overline{)\,60\,}(5 \\
-60 \\
\hline
0
\end{array}
$$

Now, we find the H.C.F. of 12 and 444.

$$
\begin{array}{r}
37 \\
12\overline{)\,444} \\
-36\downarrow \\
\hline
84 \\
-84 \\
\hline
0
\end{array}
$$

Thus, the required number $=12$ **Ans.**

10. Clearly, we must find the greatest number, which divides $(615-6)$ and $(963-6)$. So, which completely divides the 609 and 957.

First of all we find the H.C.F. of 609 and 957.

$$609\overline{)957}(1$$
$$\underline{-609}$$
$$348\overline{)609}(1$$
$$\underline{-348}$$
$$261\overline{)348}(1$$
$$\underline{-261}$$
$$87\overline{)261}(3$$
$$\underline{-261}$$
$$0$$

Thus, the required number $= 87$ **Ans.**

11. Odd, because the odd number have the odd H.C.F. **Ans.**

Exercise 4.5

1. (a) 36, 40

2	36, 40
2	18, 20
2	9, 10
5	9, 5
9	9, 1
	1, 1

Thus, required L.C.M.
$= 2 \times 2 \times 2 \times 5 \times 9 = 360$ **Ans.**

(b) 56, 70, 84

2	56, 70, 84
2	28, 35, 42
2	14, 35, 21
3	7, 35, 21
5	7, 35, 7
7	7, 7, 7
	1, 1, 1

Thus, required L.C.M.
$= 2 \times 2 \times 2 \times 3 \times 5 \times 7 = 840$

Ans.

(c) 200, 98, 70

2	200, 98, 70
2	100, 49, 35
2	50, 49, 35
5	25, 49, 35
5	5, 49, 7
7	1, 49, 7
7	1, 7, 1
	1, 1, 1

Thus, required L.C.M.
$= 2 \times 2 \times 2 \times 5 \times 5 \times 7 \times 7 = 9800$

Ans.

(d) 26, 65, 91

2	26, 65, 91
5	13, 65, 91
7	13, 13, 91
13	13, 13, 13
	1, 1, 1

Thus, required L.C.M.
$= 2 \times 5 \times 7 \times 13 = 910$ **Ans.**

(e) 24, 32, 48, 72

2	24, 32, 48, 72
2	12, 16, 24, 36
2	6, 8, 12, 18
2	3, 4, 6, 9
2	3, 2, 3, 9
3	3, 1, 3, 9
3	1, 1, 1, 3
	1, 1, 1, 1

Thus, required L.C.M.
$= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$

Ans.

(f) 22, 54, 108, 135, 198

2	22, 54, 108, 135, 198
2	11, 27, 54, 135, 99
3	11, 27, 27, 135, 99
3	11, 9, 9, 45, 33
3	11, 3, 3, 15, 11
5	11, 1, 1, 5, 11
11	11, 1, 1, 1, 11
	1, 1, 1, 1, 1

Thus, required L.C.M.
$= 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 11$
$= 5940$ **Ans.**

2. (a) 36, 48

2	36
2	18
3	9
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

$\because 36 = 2 \times 2 \times 3 \times 3$
$48 = 2 \times 2 \times 2 \times 2 \times 3$
We see here, that factor of 2 comes in 4 times and factor of 3 comes maximum 2 times.
Thus, required L.C.M.
$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$
Ans.

(b) 72, 48, 84

2	72
2	36
2	18
3	9
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

2	84
2	42
3	21
7	7
	1

$\because 72 = 2 \times 2 \times 2 \times 3 \times 3$
$48 = 2 \times 2 \times 2 \times 2 \times 3$
$84 = 2 \times 2 \times 3 \times 7$
We see here, that factor of 2 comes in maximum 4 times, factor of 3 comes in maximum 2 times and factor of 7 comes in maximum one time.
Thus, required L.C.M.
$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$
$= 1008$ **Ans.**

(c) 144, 90, 72

2	144
2	72
2	36
2	18
3	9
3	3
	1

2	90
3	45
3	15
5	5
	1

2	72
2	36
2	18
3	9
3	3
	1

$\therefore$

$$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$$
$$90 = 2 \times 3 \times 3 \times 5$$
$$72 = 2 \times 2 \times 2 \times 3 \times 3$$

We see here, that factor of 2 comes in maximum 4 times, factor of 3 comes in maximum 2 times and factor of 5 comes in 1 time.

Thus, the required L.C.M. $= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 720$ **Ans.**

(d) 17, 11, 13

17	17
	1

11	11
	1

13	13
	1

$\therefore$

$$17 = 17 \times 1$$
$$11 = 11 \times 1$$
$$13 = 13 \times 1$$

We see here, that factor of 17, 11 and 13 comes only 1 time.

Thus the required L.C.M. $= 17 \times 11 \times 13 = 2431$ **Ans.**

(e) 44, 121, 418

2	44
2	22
11	11
	1

11	121
11	11
	1

2	418
11	209
19	19
	1

$\therefore$

$$44 = 2 \times 2 \times 11$$
$$121 = 11 \times 11$$
$$418 = 2 \times 11 \times 19$$

We see here, that factor of 2 comes in maximum 2 times, factor of 11 comes in 2 times and factor of 19 comes in only one time.

Thus, the required L.C.M. $= 2 \times 2 \times 11 \times 11 \times 19 = 9196$ **Ans.**

(f) 24, 28, 35, 56

2	24
2	12
2	6
3	3
	1

2	28
2	14
7	7
	1

5	35
7	7
	1

2	56
2	28
2	14
7	7
	1

$\because$

$24 = 2 \times 2 \times 2 \times 3$

$28 = 2 \times 2 \times 7$

$35 = 5 \times 7$

$56 = 2 \times 2 \times 2 \times 7$

We see here, that factor of 2 comes in 3 times, factor of 3 comes one time, factor of 5 comes one time and factor of 7 comes one time.

Thus, the required L.C.M. $= 2 \times 2 \times 2 \times 3 \times 5 \times 7 = 840$ **Ans.**

3. First, we find the L.C.M. of 6, 9, 12 and 15.

2	9, 12, 15, 18
2	9, 6, 15, 9
3	9, 3, 15, 9
3	3, 1, 5, 3
5	1, 1, 5, 1
	1, 1, 1, 1

L.C.M. $= 2 \times 2 \times 3 \times 3 \times 5 = 180$

Greatest number of 5-digits $= 99999$

Now,

$$
\begin{array}{r}
555 \\
180 \overline{) 99999} \\
-900 \\
\hline
999 \\
-900 \\
\hline
999 \\
-900 \\
\hline
99
\end{array}
$$

Greatest number of 5-digit exactly divisible by
$180 = 99999 - 99 = 99900$

9	12	15	18
-6	-9	-12	15
3	3	3	3

We notice that the difference of division and their corresponding remainders is 3. The required number of 5-digit will be 3 less than 99900.

Thus, the required number $= 99900 - 3 = 99897$ **Ans.**

4. We know that the smallest number divisible by 36, 60 and 90 is their L.C.M. Thus, to get the required number, we less 8 in the L.C.M. of the given numbers. First of all, we calculate the L.C.M.

2	36, 60, 90
2	18, 30, 45
3	9, 15, 45
3	3, 5, 15
5	1, 5, 5
	1, 1, 1

L.C.M. $= 2 \times 2 \times 3 \times 3 \times 5 = 180$

Thus, the required number $=$ L.C.M. $- 8 = 180 - 8 = 172$ **Ans.**

5. We know that the smallest number divisible by 36, 28, 80 and 77 is their LCM. Thus, to get the required number, we add 8 in the LCM of the given number. First of all we, calculate the LCM.

2	36, 28, 80, 77
2	18, 14, 40, 77
2	9, 7, 20, 77
2	9, 7, 10, 77
5	9, 7, 5, 77
7	9, 7, 1, 77
9	9, 1, 1, 11
11	1, 1, 1, 11
	1, 1, 1, 1

LCM $= 2 \times 2 \times 2 \times 2 \times 5 \times 7 \times 9 \times 11 = 55440$

Thus, the required number $=$ LCM $+ 8 = (55440 + 8) = 55448$ **Ans.**

6. We know that the smallest number divisible by 40, 56, 70 and 210 is their LCM. Thus, to get the required number, we add 7 in the LCM of the given numbers. First of all, we calculate the LCM.

2	40, 56, 70, 210
2	20, 28, 35, 105
2	10, 14, 35, 105
3	5, 7, 35, 105
5	5, 7, 35, 35
7	1, 7, 7, 7
	1, 1, 1, 1

$LCM = 2 \times 2 \times 2 \times 3 \times 5 \times 7 = 840$

Thus, we required number $= LCM + 7 = 840 + 7 = 847$ **Ans.**

7. First of all we calculate the LCM of 300, 350 and 400 days.

2	300, 350, 400
2	150, 175, 200
2	75, 175, 100
2	75, 175, 50
3	75, 175, 25
5	25, 175, 25
5	5, 35, 5
7	1, 7, 1
	1, 1, 1

$LCM = 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 7 = 8400$

Thus, the 8400 days after they remains in the some position**Ans.**

8. We know that the smallest number divisible by 35, 45 and 55. Thus, to required number we subtract 18 in the LCM of given number. First of all we calculate the LCM.

3	35, 45, 55
3	35, 15, 55
5	35, 5, 55
7	7, 1, 11
11	1, 1, 11
	1, 1, 1

$LCM = 3 \times 3 \times 5 \times 7 \times 11 = 3465$

Thus, the required number $= LCM - 18 = 3465 - 18 = 3447$ **Ans.**

Exercise 4.6

1. (a) 35, 65
Firstly, find the HCF and LCM of the numbers 35 and 65.

$$35 \overline{)\,65\,}(1$$
$$\underline{-3\,5}$$
$$30 \overline{)\,35\,}(1$$
$$\underline{-3\,0}$$
$$5 \overline{)\,30\,}(6$$
$$\underline{-3\,0}$$
$$\times$$

$\therefore$ HCF of 35 and $65 = 5$
Now, find the LCM of the numbers:

5	35, 65
7	7, 13
13	1, 13
	1, 1

$\text{LCM} = 5 \times 7 \times 13 = 455$
Check: Product of two numbers
$= 35 \times 65 = 2275$
and product of their HCF and LCM
$= 5 \times 455 = 2275$
Hence, product of two numbers = Product of their HCF and LCM.
                                    Proved.

(b) 81, 125
Firstly, find the HCF and LCM of the numbers 81 and 125.

$$81 \overline{)\,1\,2\,5\,}(1$$
$$\underline{-8\,1}$$
$$44 \overline{)\,8\,1\,}(1$$
$$\underline{-4\,4}$$
$$37 \overline{)\,4\,4\,}(1$$
$$\underline{-3\,7}$$
$$7 \overline{)\,3\,7\,}(5$$
$$\underline{-3\,5}$$
$$2 \overline{)\,7\,}(3$$
$$\underline{-6}$$
$$1 \overline{)\,2\,}(2$$
$$\underline{-2}$$
$$\times$$

$\therefore$ HCF of 81 and $125 = 1$
Now, find the LCM of the numbers:

3	81, 125
3	27, 125
3	9, 125
3	3, 125
5	1, 125
5	1, 25
5	1, 5
	1, 1

LCM
$= 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5 = 10125$
Check: Product of the two number $= 81 \times 125 = 10125$
and product of their HCF and LCM $= 1 \times 10125 = 10125$
Hence, product of two numbers = Product of their HCF and LCM.   **Proved.**

(c) 217, 221

Firstly, find the HCF and LCM of the numbers 217 and 221.

$$
\begin{array}{r}
217\overline{)\ 2\ 2\ 1\ }(1 \\
\underline{-2\ 1\ 7} \\
4\overline{)\ 2\ 1\ 7\ }(54 \\
\underline{-2\ 0\downarrow} \\
1\ 7 \\
\underline{-1\ 6} \\
1\overline{)\ \ 4\ }(4 \\
\underline{-4}
\end{array}
$$

$\therefore$HCF of 217 and $221 = 1$ Now, find the LCM of the numbers:

LCM $= 7 \times 13 \times 17 \times 31 = 47957$

Check: Product of two numbers

$= 217 \times 221 = 47957$

and product of their HCF and

LCM $= 1 \times 47957 = 47957$

7	217, 221
13	31, 221
17	31, 17
31	31, 1
	1, 1

Hence, product of two numbers = Product of their HCF and LCM. **Proved.**

(d) 256, 836

Firstly, find the HCF and LCM of the numbers 256 and 836.

$$
\begin{array}{r}
256\overline{)\ 8\ 3\ 6\ }(3 \\
\underline{-7\ 6\ 8} \\
6\ 8\overline{)\ 2\ 5\ 6\ }(3 \\
\underline{-2\ 0\ 4} \\
5\ 2\overline{)\ 6\ 8\ }(1 \\
\underline{-5\ 2} \\
1\ 6\overline{)\ 5\ 2\ }(3 \\
\underline{-4\ 8} \\
4\overline{)\ 1\ 6\ }(4 \\
\underline{-1\ 6} \\
\times
\end{array}
$$

$\therefore$HCF of 256 and 836 = 4

Now, find the LCM of the numbers:

2	256, 836
2	128, 418
2	64, 209
2	32, 209
2	16, 209
2	8, 209
2	4, 209
2	2, 209
11	1, 209
19	1, 19
	1, 1

$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 2 \times 2$
$\times 2 \times 2 \times 11 \times 19 = 53504$

Check: Product of two numbers
$= 256 \times 836 = 214016$
and product of their HCF and
$\text{LCM} = 4 \times 53504 = 214016$
Hence, product of two numbers
$=$ Product of their HCF and
LCM.   **Proved.**
(e) Firstly, find the HCF and
LCM of the numbers 500 and
450.

$$450 \overline{)\,5\,0\,0\,} \big(1$$
$$\underline{-4\,5\,0}$$
$$5\,0 \overline{)\,4\,5\,0\,} \big(9$$
$$\underline{-4\,5\,0}$$
$$\times$$

$\therefore$HCF of 450 and 500
$= 50$.
Now, find the LCM of
the numbers:

2	450, 500
2	225, 250
3	225, 125
3	75, 125
5	25, 125
5	5, 25
5	1, 5
	1, 1

$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 5$
$= 4500$

Check: Product of two numbers $= 450 \times 500 = 225000$
and product of their HCF and LCM $= 50 \times 4500 = 225000$
Hence, product of two numbers $=$ Product of their HCF and
LCM.   **Proved.**

(f) Firstly, find the HCF and LCM of the numbers 676 and 920.

```
676)  9 2 0  (1
      −6 7 6
       2 4 4 )  6 7 6  (2
               −4 8 8
                1 8 8 )  2 4 4  (1
                        −1 8 8
                          5 6 )  1 8 8  (3
                                −1 6 8
                                  2 0 )  5 6  (2
                                       −4 0
                                        1 6 )  2 0  (1
                                             −1 6
                                               4 )  1 6  (4
                                                  −1 6
                                                    ×
```

∴HCF of 676 and 920 = 4

Now, find the LCM of the numbers:

2	676, 920
2	338, 460
2	169, 230
5	169, 115
13	169, 23
13	13, 23
23	1, 23
	1, 1

$LCM = 2 \times 2 \times 2 \times 5 \times 13 \times 13 \times 23 = 155480$

Check: Product of two numbers $= 676 \times 920 = 621920$

and product of their HCF and LCM $= 4 \times 155480 = 621920$

Hence, product of two numbers = Product of their HCF and LCM. **Proved.**

2. We know that,

Product of two number = Product of their HCF and LCM.

So, $169 =$ Product of their HCF and LCM

Thus, the product of HCF and LCM $=169$ **Ans.**

3. We know that,

Product of two number $=$ Product of their HCF and LCM.

So, $6400 = 32 \times \text{LCM}$

or $\text{LCM} \times 32 = 6400$

or $\text{LCM} = \dfrac{6400}{32}$ or $\text{LCM} = 200$

Thus, $\text{LCM} = 200$ **Ans.**

4. We know that,

First number $\times$ Second number $=$ HCF $\times$ LCM

$144 \times$ Second number $= 36 \times 504$

or Second number $= \dfrac{36 \times 504}{144}$

or Second number $= 126$

Thus, the second number $= 126$ **Ans.**

5. We know that,

The finding of HCF by division method.

So, we find the HCF of 2211 and 5025.

$$
\begin{array}{r}
2211\overline{\smash{\big)}\,5025\,}\,(2 \\
\underline{-4422} \\
603\overline{\smash{\big)}\,2211\,}\,(3 \\
\underline{-1809} \\
402\overline{\smash{\big)}\,603\,}\,(1 \\
\underline{-402} \\
201\overline{\smash{\big)}\,402\,}\,(2 \\
\underline{-402} \\
\times
\end{array}
$$

$\therefore$ HCF of 2211 and 5025 $= 201$.

Then find the LCM of 2211, 5025 and 201 by division method.

3	2211, 5025, 201
5	737, 1675, 67
5	737, 335, 67
11	737, 67, 67
67	67, 67, 67
	1, 1, 1

$$\therefore LCM = 3 \times 5 \times 5 \times 11 \times 67 = 55275$$

Thus, LCM $= 55275$ **Ans.**

6. We know that,

First number $\times$ Second number $=$ HCF $\times$ LCM

or $170 \times$ Second number $= 64 \times 850$

or Second number $= \dfrac{64 \times 850}{170}$

$\therefore$ Second number $= 320$

Thus, the second number $= 320$ **Ans.**

Multiple Choice Questions

1. (i) d   (ii) a   (iii) b   (iv) c   (v) a

5. Fractions

Exercise 5.1

1. (a) The descending order of $\dfrac{1}{5}, \dfrac{1}{8}, \dfrac{1}{3}, \dfrac{1}{2}, \dfrac{1}{7}, \dfrac{1}{4}, \dfrac{1}{6}$

    are: $\dfrac{1}{2}, \dfrac{1}{3}, \dfrac{1}{4}, \dfrac{1}{5}, \dfrac{1}{6}, \dfrac{1}{7}, \dfrac{1}{8}$ **Ans.**

(b) The descending order of $\dfrac{3}{5}, \dfrac{3}{9}, \dfrac{3}{6}, \dfrac{3}{12}, \dfrac{3}{2}, \dfrac{3}{21}, \dfrac{3}{7}$

    are: $\dfrac{3}{2}, \dfrac{3}{5}, \dfrac{3}{6}, \dfrac{3}{7}, \dfrac{3}{9}, \dfrac{3}{12}, \dfrac{3}{21}$ **Ans.**

(c) The descending order of $\dfrac{2}{3}, \dfrac{3}{5}, \dfrac{7}{10}, \dfrac{8}{15}, \dfrac{8}{24}, \dfrac{7}{9}$

    are: $\dfrac{7}{9}, \dfrac{7}{10}, \dfrac{2}{3}, \dfrac{3}{5}, \dfrac{8}{15}, \dfrac{8}{24}$ **Ans.**

(d) The descending order of $\dfrac{7}{9}, \dfrac{5}{12}, \dfrac{11}{18}, \dfrac{17}{36}, \dfrac{8}{32}, \dfrac{10}{36}$

    are: $\dfrac{7}{9}, \dfrac{11}{18}, \dfrac{17}{36}, \dfrac{5}{12}, \dfrac{10}{36}, \dfrac{8}{32}$ **Ans.**

2. (a) The ascending order of $\dfrac{1}{7}, \dfrac{1}{8}, \dfrac{1}{3}, \dfrac{1}{5}, \dfrac{1}{4}, \dfrac{1}{6}, \dfrac{1}{9}$

    are: $\dfrac{1}{9}, \dfrac{1}{8}, \dfrac{1}{7}, \dfrac{1}{6}, \dfrac{1}{5}, \dfrac{1}{4}, \dfrac{1}{3}$ **Ans.**

(b) The ascending order of $\dfrac{2}{3}, \dfrac{1}{6}, \dfrac{5}{9}, \dfrac{7}{12}, \dfrac{5}{6}, \dfrac{4}{9}$

are: $\dfrac{1}{6}, \dfrac{4}{9}, \dfrac{5}{9}, \dfrac{7}{12}, \dfrac{2}{3}, \dfrac{5}{6}$ **Ans.**

(c) The ascending order of $\dfrac{1}{2}, \dfrac{3}{4}, \dfrac{5}{6}, \dfrac{7}{8}, \dfrac{1}{7}, \dfrac{2}{9}$

are: $\dfrac{1}{7}, \dfrac{2}{9}, \dfrac{1}{2}, \dfrac{3}{4}, \dfrac{5}{6}, \dfrac{7}{8}$ **Ans.**

(d) The ascending order of $\dfrac{2}{5}, \dfrac{7}{10}, \dfrac{11}{15}, \dfrac{17}{30}, \dfrac{27}{30}, \dfrac{21}{24}$

are: $\dfrac{2}{5}, \dfrac{17}{30}, \dfrac{7}{10}, \dfrac{11}{16}, \dfrac{21}{24}, \dfrac{27}{30}$ **Ans.**

3. (a) $\dfrac{1}{3} = 0.33$ and $\dfrac{1}{2} = 0.50$

$\because 0.50 > 0.33$ $\qquad\qquad \therefore \dfrac{1}{2} > \dfrac{1}{3}$

Thus, $\dfrac{1}{2}$ is larger fraction. **Ans.**

(b) $\dfrac{7}{16} = 0.4375$ and $\dfrac{8}{16} = 0.50$

$\because 0.50 > 0.4375$ $\qquad\qquad \therefore \dfrac{8}{16} > \dfrac{7}{16}$

Thus, $\dfrac{8}{16}$ is larger fraction. **Ans.**

(c) $\dfrac{3}{27} = 0.111$ and $\dfrac{3}{21} = 0.142$

$\because 0.142 > 0.111$ $\qquad\qquad \therefore \dfrac{3}{21} > \dfrac{3}{27}$

Thus, $\dfrac{3}{21}$ is larger fraction. **Ans.**

(d) $\dfrac{7}{12} = 0.583$ and $\dfrac{9}{16} = 0.5625$

$\because 0.583 > 0.5625 \quad \therefore \dfrac{7}{12} > \dfrac{9}{16}$

Thus, $\dfrac{7}{12}$ is larger fraction. **Ans.**

4. (a) $\dfrac{36}{24} = \dfrac{36 \div 12}{24 \div 12} = \dfrac{3}{2} = 1\dfrac{1}{2}$ **Ans.** (b) $\dfrac{49}{56} = \dfrac{49 \div 7}{56 \div 7} = \dfrac{7}{8}$ **Ans.**

(c) $\dfrac{120}{360} = \dfrac{120 \div 120}{360 \div 120} = \dfrac{1}{3}$ **Ans.**   (d) $\dfrac{125}{625} = \dfrac{125 \div 125}{625 \div 125} = \dfrac{1}{5}$ **Ans.**

(e) $\dfrac{108}{132} = \dfrac{108 \div 12}{132 \div 12} = \dfrac{9}{11}$ **Ans.**   (f) $\dfrac{91}{104} = \dfrac{91 \div 13}{104 \div 13} = \dfrac{7}{8}$ **Ans.**

5. (a) $\dfrac{1}{2} = \dfrac{1 \times 2}{2 \times 2} = \dfrac{2}{4}; \ \dfrac{1}{2} = \dfrac{1 \times 3}{2 \times 3} = \dfrac{3}{6}; \ \dfrac{1}{2} = \dfrac{1 \times 4}{2 \times 4} = \dfrac{4}{8}; \ \dfrac{1}{2} = \dfrac{1 \times 5}{2 \times 5} = \dfrac{5}{10}$

Thus, $\dfrac{2}{4}, \dfrac{3}{6}, \dfrac{4}{8}, \dfrac{5}{10}$ are the equivalent fractions of $\dfrac{1}{2}$. **Ans.**

(b) $\dfrac{4}{3} = \dfrac{4 \times 2}{3 \times 2} = \dfrac{8}{6}; \ \dfrac{4}{3} = \dfrac{4 \times 3}{3 \times 3} = \dfrac{12}{9}; \ \dfrac{4}{3} = \dfrac{4 \times 4}{3 \times 4} = \dfrac{16}{12}; \ \dfrac{4}{3} = \dfrac{4 \times 5}{3 \times 5} = \dfrac{20}{15}$

Thus, $\dfrac{8}{6}, \dfrac{12}{9}, \dfrac{16}{12}, \dfrac{20}{15}$ are the equivalent fraction of $\dfrac{4}{3}$ **Ans.**

(c) $\dfrac{3}{5} = \dfrac{3 \times 2}{5 \times 2} = \dfrac{6}{10}; \ \dfrac{3}{5} = \dfrac{3 \times 3}{5 \times 3} = \dfrac{9}{15}; \ \dfrac{3}{5} = \dfrac{3 \times 4}{5 \times 4} = \dfrac{12}{20}; \ \dfrac{3}{5} = \dfrac{3 \times 5}{5 \times 5} = \dfrac{15}{25}$

Thus, $\dfrac{6}{10}, \dfrac{9}{15}, \dfrac{12}{20}, \dfrac{15}{25}$ are the equivalent fraction of $\dfrac{3}{5}$ **Ans.**

(d) $\dfrac{4}{9} = \dfrac{4 \times 2}{9 \times 2} = \dfrac{8}{18}; \ \dfrac{4}{9} = \dfrac{4 \times 3}{9 \times 3} = \dfrac{12}{27}; \ \dfrac{4}{9} = \dfrac{4 \times 4}{9 \times 4} = \dfrac{16}{36}; \ \dfrac{4}{9} = \dfrac{4 \times 5}{9 \times 5} = \dfrac{20}{45}$

Thus, $\dfrac{8}{18}, \dfrac{12}{27}, \dfrac{16}{36}, \dfrac{20}{45}$ are the equivalent fraction of $\dfrac{4}{9}$ **Ans.**

(e) $\dfrac{7}{8} = \dfrac{7 \times 2}{8 \times 2} = \dfrac{14}{16}; \ \dfrac{7}{8} = \dfrac{7 \times 3}{8 \times 3} = \dfrac{21}{24}; \ \dfrac{7}{8} = \dfrac{7 \times 4}{8 \times 4} = \dfrac{28}{32}; \ \dfrac{7}{8} = \dfrac{7 \times 5}{8 \times 5} = \dfrac{35}{40}$

Thus, $\dfrac{14}{16}, \dfrac{21}{24}, \dfrac{28}{32}, \dfrac{35}{40}$ are the equivalent fractions of $\dfrac{7}{8}$ **Ans.**

(f) $\dfrac{25}{9} = \dfrac{25 \times 2}{9 \times 2} = \dfrac{50}{18}; \ \dfrac{25}{9} = \dfrac{25 \times 3}{9 \times 3} = \dfrac{75}{27}; \ \dfrac{25}{9} = \dfrac{25 \times 4}{9 \times 4} = \dfrac{100}{36};$

$\dfrac{25}{9} = \dfrac{25 \times 5}{9 \times 5} = \dfrac{125}{45}$

Thus, $\dfrac{50}{18}, \dfrac{75}{27}, \dfrac{100}{36}, \dfrac{125}{45}$ are the equivalent fractions of $\dfrac{25}{9}$ **Ans.**

6. (a) $2\dfrac{6}{7} = \dfrac{2 \times 7 + 6}{7} = \dfrac{20}{7}$ **Ans.**   (b) $10\dfrac{3}{5} = \dfrac{10 \times 5 + 3}{5} = \dfrac{53}{5}$ **Ans.**

(c) $3\dfrac{9}{11} = \dfrac{3 \times 11 + 9}{11} = \dfrac{42}{11}$ **Ans.**   (d) $8\dfrac{7}{25} = \dfrac{8 \times 25 + 7}{25} = \dfrac{207}{25}$ **Ans.**

7. (a) $\dfrac{21}{5} = \dfrac{21}{5} = 4\dfrac{1}{5}$ **Ans.** (b) $\dfrac{35}{9} = \dfrac{35}{9} = 3\dfrac{8}{9}$ **Ans.**

(c) $\dfrac{47}{6} = \dfrac{47}{6} = 7\dfrac{5}{6}$ **Ans.**   (d) $\dfrac{35}{23} = \dfrac{35}{23} = 1\dfrac{12}{23}$ **Ans.**

(e) $\dfrac{27}{6} = \dfrac{27}{6} = 4\dfrac{3}{6}$ **Ans.**   (f) $\dfrac{25}{19} = \dfrac{25}{19} = 1\dfrac{6}{19}$ **Ans.**

8. (a) $\dfrac{5}{8}$

$\begin{array}{cccc} S & R & Q & P \\ \bullet & \bullet & \bullet & \bullet \\ \dfrac{2}{8} & \dfrac{3}{8} & \dfrac{4}{8} & \dfrac{5}{8} \end{array}$

9. (a) $\dfrac{3}{6}$ (b) $\dfrac{2}{4}$ (c) $\dfrac{5}{9}$

(d) $\dfrac{12}{20}$ (e) $\dfrac{1}{2}$ (f) $\dfrac{3}{11}$
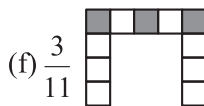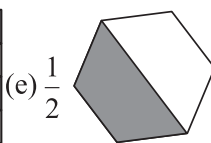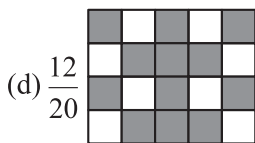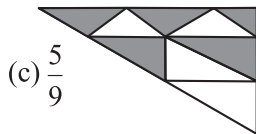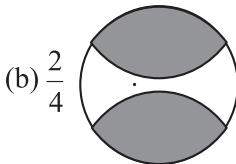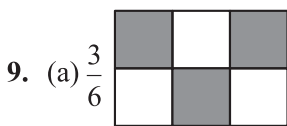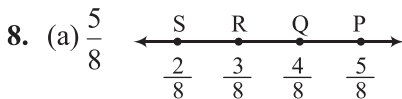
10. (a) $\dfrac{5}{8}$ (b) $\dfrac{1}{4}$ (c) $\dfrac{2}{3}$ (d) $\dfrac{3}{8}$ (e) $\dfrac{1}{2}$

(f) $\dfrac{2}{5}$ (g) $\dfrac{5}{15}$ or $\dfrac{1}{3}$ (h) $\dfrac{4}{8}$ or $\dfrac{1}{2}$

Exercise 5.2

1. (a) $6\dfrac{1}{3} + 2\dfrac{2}{3} = \dfrac{19}{3} + \dfrac{8}{3} = \dfrac{19+8}{3} = \dfrac{27}{3} = 9$ **Ans.**

(b) $9\dfrac{7}{9} + 5\dfrac{1}{9} = \dfrac{88}{9} + \dfrac{46}{9} = \dfrac{88+46}{9} = \dfrac{134}{9} = 14\dfrac{8}{9}$ **Ans.**

(c) $4\dfrac{1}{8} + 3\dfrac{7}{8} = \dfrac{33}{8} + \dfrac{31}{8} = \dfrac{33+31}{8} = \dfrac{64}{8} = 8$ **Ans.**

(d) $6\dfrac{2}{3} - 2\dfrac{1}{3} = \dfrac{20}{3} - \dfrac{7}{3} = \dfrac{20-7}{3} = \dfrac{13}{3} = 4\dfrac{1}{3}$ **Ans.**

(e) $4\dfrac{7}{8} - 3\dfrac{1}{8} = \dfrac{39}{8} - \dfrac{25}{8} = \dfrac{39-25}{8} = \dfrac{14}{8} = \dfrac{7}{4} = 1\dfrac{3}{4}$ **Ans.**

(f) $8\dfrac{1}{2} - 3\dfrac{1}{2} = \dfrac{17}{2} - \dfrac{7}{2} = \dfrac{17-7}{2} = \dfrac{10}{2} = 5$ **Ans.**

2. (a) $\dfrac{17}{23} - \dfrac{12}{23} = \dfrac{17-12}{23} = \dfrac{5}{23}$ **Ans.**

(b) $\dfrac{15}{19} - \dfrac{4}{19} = \dfrac{15-4}{19} = \dfrac{11}{19}$ **Ans.**

(c) $\dfrac{26}{5} - \dfrac{8}{5} = \dfrac{26-8}{5} = \dfrac{18}{5} = 3\dfrac{3}{5}$ **Ans.**

(d) $2 - \dfrac{2}{3} = \dfrac{2}{1} - \dfrac{2}{3} = \dfrac{6-2}{3} = \dfrac{4}{3} = 1\dfrac{1}{3}$ **Ans.**

(e) $\dfrac{24}{45} - \dfrac{7}{45} = \dfrac{24-7}{45} = \dfrac{17}{45}$ **Ans.**

(f) $\dfrac{76}{81} - \dfrac{65}{81} = \dfrac{76-65}{81} = \dfrac{11}{81}$ **Ans.**

3. (a) $\dfrac{4}{17} + \dfrac{5}{17} = \dfrac{4+5}{17} = \dfrac{9}{17}$ **Ans.**

(b) $\dfrac{18}{41} + \dfrac{7}{41} = \dfrac{18+7}{41} = \dfrac{25}{41}$ **Ans.**

(c) $\dfrac{15}{19} + \dfrac{6}{19} = \dfrac{15+6}{19} = \dfrac{21}{19} = 1\dfrac{2}{19}$ **Ans.**

(d) $\dfrac{6}{21} + \dfrac{17}{21} = \dfrac{6+17}{21} = \dfrac{23}{21} = 1\dfrac{2}{21}$ **Ans.**

(e) $\dfrac{3}{7} + \dfrac{4}{7} = \dfrac{3+4}{7} = \dfrac{7}{7} = 1$ **Ans.**

(f) $\dfrac{5}{29} + \dfrac{7}{29} = \dfrac{5+7}{29} = \dfrac{12}{29}$ **Ans.**

4. Mohan painted the wall of the room $= \dfrac{3}{5}$ of wall

Gaurav painted the wall of the room $= \dfrac{1}{5}$ of wall

$\because$ They painted together $= \dfrac{3}{5}$ of wall $+ \dfrac{1}{5}$ of wall

$= \dfrac{3}{5}$ of wall $\dfrac{1}{5}$ of wall $= \dfrac{3+1}{5}$ of wall $= \dfrac{4}{5}$ of wall

Remaining wall $=$ Total wall $-$ painted wall

$$= 1 - \dfrac{4}{5} = \dfrac{5-4}{5} = \dfrac{1}{5}$$

Thus, the wall painted $\dfrac{4}{5}$ and remaining wall $= \dfrac{1}{5}$ **Ans.**

5. Suresh got $\dfrac{16}{18}$ of basket of oranges.

Oranges left in the basket $=1-\dfrac{16}{18}=1-\dfrac{8}{9}=\dfrac{9-8}{9}=\dfrac{1}{9}$

Thus, left oranges in basket $=\dfrac{1}{9}$ **Ans.**

6. Cost of 1 kg sugar = ₹ $11\dfrac{1}{3}$ or ₹ $\dfrac{34}{3}$

Cost of 1 kg rice = ₹ $10\dfrac{2}{3}$ or ₹ $\dfrac{32}{3}$

The total cost of both = ₹ $\dfrac{34}{3}$ + ₹ $\dfrac{32}{3}$ = ₹ $\dfrac{34+32}{3}$ = ₹ $\dfrac{66}{3}$ = ₹ 22

Thus, the total cost of sugar and rice is ₹ 22 **Ans.**

Exercise 5.3

1. (a) $1\dfrac{3}{4}+1\dfrac{2}{4}=\dfrac{7}{4}+\dfrac{6}{4}=\dfrac{7+6}{4}=\dfrac{13}{4}=3\dfrac{1}{4}$ **Ans.**

(b) $4\dfrac{3}{4}+3\dfrac{2}{4}=\dfrac{19}{4}+\dfrac{14}{4}=\dfrac{19+14}{4}=\dfrac{33}{4}=8\dfrac{1}{4}$ **Ans.**

(c) $2\dfrac{7}{8}+1\dfrac{4}{16}=\dfrac{23}{8}+\dfrac{20}{16}$

∵ LCM of 8 and 16 is 16.

∴ $\dfrac{23}{8}+\dfrac{20}{16}=\dfrac{23\times2+20\times1}{16}=\dfrac{46+20}{16}=\dfrac{66}{16}=\dfrac{33}{8}=4\dfrac{1}{8}$ **Ans.**

(d) $3\dfrac{3}{8}-2\dfrac{1}{6}=\dfrac{27}{8}-\dfrac{13}{6}$

∵ LCM of 8 and 6 is 24.

∴ $\dfrac{27}{8}-\dfrac{13}{6}=\dfrac{27\times3-13\times4}{24}=\dfrac{81-52}{24}=\dfrac{29}{24}=1\dfrac{5}{24}$ **Ans.**

(e) $8\dfrac{1}{4}-3\dfrac{5}{6}=\dfrac{33}{4}-\dfrac{23}{6}$

∵ LCM of 4 and 6 is 12.

∴ $\dfrac{33}{4}-\dfrac{23}{6}=\dfrac{33\times3-23\times2}{12}=\dfrac{99-46}{12}=\dfrac{53}{12}=4\dfrac{5}{12}$ **Ans.**

(f) $3\dfrac{2}{4}-1\dfrac{1}{16}=\dfrac{14}{4}-\dfrac{17}{16}$

∵ LCM of 4 and 16 is 16.

$\therefore \quad \dfrac{14}{4} - \dfrac{17}{16} = \dfrac{14 \times 4 - 17 \times 1}{16} = \dfrac{56-17}{16} = \dfrac{39}{16} = 2\dfrac{7}{16}$ **Ans.**

2. (a) $\dfrac{1}{12} + \dfrac{4}{3}$

∵ LCM of 12 and 3 is 12.

$\therefore \quad \dfrac{1}{12} + \dfrac{4}{3} = \dfrac{1 \times 1 + 4 \times 4}{12} = \dfrac{1+16}{12} = \dfrac{17}{12} = 1\dfrac{5}{12}$ **Ans.**

(b) $\dfrac{17}{8} + \dfrac{3}{24}$

∵ LCM of 8 and 24 is 24.

$\therefore \quad \dfrac{17}{8} + \dfrac{3}{24} = \dfrac{17 \times 3 + 3 \times 1}{24} = \dfrac{51+3}{24} = \dfrac{54}{24} = \dfrac{9}{4} = 2\dfrac{1}{4}$ **Ans.**

(c) $\dfrac{4}{15} + \dfrac{12}{20}$

∵ LCM of 15 and 20 is 60.

$\therefore \quad \dfrac{4}{15} + \dfrac{12}{20} = \dfrac{4 \times 4 + 12 \times 3}{60} = \dfrac{16+36}{60} = \dfrac{52}{60} = \dfrac{13}{15}$ **Ans.**

(d) $\dfrac{4}{2} + \dfrac{5}{3} + \dfrac{7}{6}$

∵ LCM of 2, 3 and 6 is 6.

$\therefore \dfrac{4}{2} + \dfrac{5}{3} + \dfrac{7}{6} = \dfrac{4 \times 3 + 5 \times 2 + 7 \times 1}{6} = \dfrac{12+10+7}{6} = \dfrac{29}{6} = 4\dfrac{5}{6}$ **Ans.**

(e) $\dfrac{1}{12} + \dfrac{3}{8} + \dfrac{17}{16}$

∵ LCM of 12, 8 and 16 is 48.

$\therefore \dfrac{1}{12} + \dfrac{3}{8} + \dfrac{17}{16} = \dfrac{1 \times 4 + 3 \times 6 + 17 \times 3}{48} = \dfrac{4+18+51}{48} = \dfrac{73}{48} = 1\dfrac{25}{48}$ **Ans.**

(f) $\dfrac{4}{5} + \dfrac{9}{10} + \dfrac{7}{15}$

∵ LCM of 5, 10 and 15 is 30.

$\therefore \dfrac{4}{5} + \dfrac{9}{10} + \dfrac{7}{15} = \dfrac{4 \times 6 + 9 \times 3 + 7 \times 2}{30} = \dfrac{24+27+14}{30} = \dfrac{65}{30} = \dfrac{13}{6} = 2\dfrac{1}{6}$

Ans.

3. (a) $\dfrac{13}{4} - \dfrac{1}{3}$

∵ LCM of 4 and 3 is 12.

$$\therefore \quad \frac{13}{4} - \frac{1}{3} = \frac{13 \times 3 - 1 \times 4}{12} = \frac{39 - 4}{12} = \frac{35}{12} = 2\frac{11}{12} \qquad \textbf{Ans.}$$

(b) $\dfrac{8}{12} - \dfrac{1}{3}$

$\because$ LCM of 12 and 3 is 12.

$$\therefore \quad \frac{8}{12} - \frac{1}{3} = \frac{8 \times 1 - 1 \times 4}{12} = \frac{8 - 4}{12} = \frac{4}{12} = \frac{1}{3} \qquad \textbf{Ans.}$$

(c) $\dfrac{10}{18} - \dfrac{1}{4}$

$\because$ LCM of 18 and 4 is 36.

$$\therefore \quad \frac{10}{18} - \frac{1}{4} = \frac{10 \times 2 - 1 \times 9}{36} = \frac{20 - 9}{36} = \frac{11}{36} \qquad \textbf{Ans.}$$

(d) $2 - \dfrac{3}{4} = \dfrac{2}{1} - \dfrac{3}{4}$

$\because$ LCM of 1 and 4 is 4.

$$\therefore \quad \frac{2}{1} - \frac{3}{4} = \frac{2 \times 4 - 3 \times 1}{4} = \frac{8 - 3}{4} = \frac{5}{4} = 1\frac{1}{4} \qquad \textbf{Ans.}$$

(e) $\dfrac{17}{8} - \dfrac{3}{16}$

$\because$ LCM of 8 and 16 is 16.

$$\therefore \quad \frac{17}{8} - \frac{3}{16} = \frac{17 \times 2 - 3 \times 1}{16} = \frac{34 - 3}{16} = \frac{31}{16} = 1\frac{15}{16} \qquad \textbf{Ans.}$$

(f) $\dfrac{2}{2} - \dfrac{1}{8}$

$\because$ LCM of 2 and 8 is 8.

$$\therefore \quad \frac{2}{2} - \frac{1}{8} = \frac{2 \times 4 - 1 \times 1}{8} = \frac{8 - 1}{8} = \frac{7}{8} \qquad \textbf{Ans.}$$

4. The cost of a pen = ₹ $6\dfrac{1}{4}$ or ₹ $\dfrac{25}{4}$

The cost or pencil = ₹ $4\dfrac{5}{6}$ or ₹ $\dfrac{29}{6}$

$\because$ LCM of 4 and 6 is 12.

$\therefore$ Cost of pen = ₹ $\dfrac{29 \times 2}{6 \times 2}$ = ₹ $\dfrac{58}{12}$ and ₹ $\dfrac{25}{4}$ = ₹ $\dfrac{25 \times 3}{4 \times 3}$ = ₹ $\dfrac{75}{12}$

$\because 75 > 58$

So, $\dfrac{75}{12} > \dfrac{58}{12}$

How much $= \dfrac{75}{12} - \dfrac{58}{12} = \dfrac{75-58}{12} = \dfrac{17}{12} = 1\dfrac{5}{12}$

Thus, the cost of pen is more by ₹ $1\dfrac{5}{12}$ **Ans.**

5. Sakshi bought ribbon $= 8\dfrac{4}{7}$ m or $\dfrac{60}{7}$ m

Arti bought ribbon $= 3\dfrac{4}{9}$ m or $\dfrac{31}{9}$ m

So, the total length of the ribbon $= \dfrac{60}{7}$ m $+ \dfrac{31}{9}$ m

∵ LCM of the 7 and 9 is 63.

∴$\dfrac{60}{7} + \dfrac{31}{9} = \dfrac{60\times 9 + 31 \times 7}{63} = \dfrac{540 + 217}{63} = \dfrac{757}{63} = 12\dfrac{1}{63}$

Thus, the total length of ribbon $12\dfrac{1}{63}$ metre **Ans.**

6. Sumit takes time to across the ground $= 2\dfrac{4}{5}$ minute or $\dfrac{14}{5}$ minute

Amit takes time to across the ground $= \dfrac{17}{4}$ minute

∵ LCM of 5 and 4 is 20.

∴Sumit takes time $= \dfrac{14}{5}$ or $\dfrac{14 \times 4}{5 \times 4} = \dfrac{56}{20}$

∴Amit takes time $= \dfrac{17}{4}$ or $\dfrac{17 \times 5}{4 \times 5} = \dfrac{85}{20}$

So, $\dfrac{56}{20} < \dfrac{85}{20}$

Sumit takes less time because $\dfrac{56}{20}$ is less than $\dfrac{85}{20}$.

Required time $= \dfrac{85}{20} - \dfrac{56}{20} = \dfrac{85-56}{20} = \dfrac{29}{20} = 1\dfrac{9}{20}$ minutes

Thus, Sumit take less time $1\dfrac{9}{20}$ minute **Ans.**

7. Moni got piece of cake $= 4\dfrac{1}{2}$ or $\dfrac{9}{2}$

Nagma got piece of cake $= 1\dfrac{1}{3}$ or $\dfrac{4}{3}$

Total piece of cake both them $= \dfrac{9}{2} + \dfrac{4}{3}$

$\because$ LCM of 2 and 3 is 6.

$\therefore \dfrac{9}{2} + \dfrac{4}{3} = \dfrac{9 \times 3 + 4 \times 2}{6} = \dfrac{27 + 8}{6} = \dfrac{35}{6} = 5\dfrac{5}{6}$

Thus, the total piece of cake $= 5\dfrac{5}{6}$ **Ans.**

8. Total length of wire $= \dfrac{7}{8}$ metre

Break into two pieces then, length of the piece $= \dfrac{3}{4}$ metre

So, the length of second piece of wire $= \left(\dfrac{7}{8} - \dfrac{3}{4} \right)$ metre

$\because$ LCM of 8 and 4 is 8.

$\dfrac{7}{8} - \dfrac{3}{4} = \dfrac{7 - 3 \times 2}{8} = \dfrac{7 - 6}{8} = \dfrac{1}{8}$

Thus, the length of second wire $= \dfrac{1}{8}$ metre **Ans.**

Multiple Choice Questions

1. (i) b   (ii) b   (iii) c   (iv) a   (v) c

6. Decimal

Exercise 6.1

1. (a) $46.72 = 40 + 6 + 0.7 + 0.02$ (b) $26.08 = 20 + 6 + 0.08$
   (c) $255.316 = 200 + 50 + 5 + 0.3 + 0.01 + 0.006$
   (d) $40.18 = 40 + 0.1 + 0.08$ (e) $860.32 = 800 + 60 + 0.3 + 0.02$
   (f) $36.070 = 30 + 6 + 0.07$
2. (a) $96.1 =$ Ninety six point one.
   (b) $8.27 =$ Eight point two seven.
   (c) $0.06 =$ Zero point zero six.
   (d) $125.028 =$ One hundred twenty five point zero two eight.
   (e) $812.205 =$ Eight hundred twelve point two zero five.
   (f) $25.62 =$ Twenty five point six two.
3. (a) Sixty five decimal six four $= 65.64$
   (b) Ten decimal four three $= 10.43$
   (c) Nine decimal two tenths six hundredths $= 9.26$

(d) Three hundred forty two decimal six hundredths and three thousands = 342.063

(e) Five hundred twenty seven decimal nine hundredths = 527.09

(f) Eight decimal four zero six = 8.406

4. (a) The descending order of given decimals 35.5, 40.64, 94.09, 6.608 are: 94.09, 40.64, 35.5, 6.608

(b) The descending order of given decimals 13.6, 143.8, 16.07, 17.997, 185.008 are: 185.008, 143.8, 17.997, 16.07, 13.6

(c) The descending order of given decimals 20.06, 700.1, 4.003, 8.3003, 20.001 are: 700.1, 20.06, 20.001, 8.3003, 4.003

(d) The descending order of given decimals 4.67, 2.37, 1.06, 45.7, 12.39, 14.618 are: 45.7, 14.618, 12.39, 4.67, 2.37, 1.06

5. (a) The ascending order of given decimals 18.07, 18.18, 18.6, 9.003, 11.76 are: 9.003, 11.76, 18.07, 18.18, 18.6

(b) The ascending order of given decimals 2.01, 16.34, 150.4, 18.74, 13.1, 19.86 are: 2.01, 13.1, 16.34, 18.74, 19.86, 150.4

(c) The ascending order of given decimals 3.7, 4.06, 9.67, 2.84, 82.607, 4.96 are: 2.84, 3.7, 4.06, 4.96, 9.67, 82.607

(d) The ascending order of given decimals 96.68, 9.69, 861.5, 96.08, 9.26, 47.6 are: 9.26, 9.69, 47.6, 96.08, 96.68, 861.5

6. (a) $75.8 > 47.81$ (b) $7.92 > 6.102$ (c) $16.831 > 4.981$

(d) $15.574 < 22.106$

7. (a) $8.4 = 8.400, 63.31 = 63.310$ and $0.087 = 0.087$
Hence, like decimals are 8.400, 63.310 and 0.087.

(b) $0.096 = 0.096, 2.81 = 2.810, 8.54 = 8.540$ and $2.3 = 2.300$
Hence, like decimals are: 0.096, 2.810, 8.540, 2.300.

(c) $4.4 = 4.40, 0.06 = 0.06, 4.67 = 4.67$ and $3.8 = 3.80$
Hence, like decimals are: 4.40, 0.06, 4.67, 3.80.

(d) $9.6 = 9.600, 0.26 = 0.260, 15.08 = 15.080$ and $40.691 = 40.691$
Hence, like decimals are: 9.600, 0.260, 15.080, 40.691.

8. (a) $40 + 8 + \dfrac{6}{10} + \dfrac{7}{100} = 40 + 8 + .6 + .07 = 48.67$

(b) $40 + \dfrac{9}{100} + \dfrac{8}{1000} + \dfrac{6}{10000} = 40 + .09 + .008 + 0.0006 = 40.0986$

(c) $800 + 50 + \dfrac{4}{10} + \dfrac{7}{1000} = 800 + 50 + .4 + 0.007 = 850.407$

(d) $\dfrac{16}{10} + \dfrac{7}{100} + \dfrac{9}{10000} + \dfrac{6}{100000} = 1.6 + .07 + .0009 + .00006$

$$= 1.67096$$

Exercise 6.2

1. (a) $\dfrac{73}{10} = 7.3$ (b) $\dfrac{186}{1000} = 0.186$ (c) $\dfrac{2723}{100} = 27.23$

(d) $\dfrac{1981}{1000} = 1.981$ (e) $\dfrac{15}{4} = 3.75$ (f) $19\dfrac{1}{8} = \dfrac{153}{8} = 19.125$

(g) $4\dfrac{3}{8} = \dfrac{35}{8} = 4.375$ (h) $15\dfrac{27}{40} = \dfrac{627}{40} = 15.675$

(i) $4\dfrac{29}{40} = \dfrac{189}{40} = 4.725$

2. (a) $0.08 = \dfrac{8}{100} = \dfrac{8 \div 4}{100 \div 4} = \dfrac{2}{25}$ (b) $0.15 = \dfrac{15}{100} = \dfrac{15 \div 5}{100 \div 5} = \dfrac{3}{20}$

(c) $.04 = \dfrac{4}{100} = \dfrac{4 \div 4}{100 \div 4} = \dfrac{1}{25}$ (d) $0.085 = \dfrac{85}{1000} = \dfrac{85 \div 5}{1000 \div 5} = \dfrac{17}{200}$

(e) $0.125 = \dfrac{125}{1000} = \dfrac{125 \div 125}{1000 \div 125} = \dfrac{1}{8}$

(f) $0.70 = \dfrac{70}{100} = \dfrac{70 \div 10}{100 \div 10} = \dfrac{7}{10}$

(g) $0.050 = \dfrac{50}{1000} = \dfrac{50 \div 50}{1000 \div 50} = \dfrac{1}{20}$

(h) $0.951 = \dfrac{951}{1000} = \dfrac{951}{1000}$

(i) $0.28 = \dfrac{28}{100} = \dfrac{28 \div 4}{100 \div 4} = \dfrac{7}{25}$ (j) $0.621 = \dfrac{621}{1000}$

(k) $0.006 = \dfrac{6}{1000} = \dfrac{6 \div 2}{1000 \div 2} = \dfrac{3}{500}$

(l) $0.425 = \dfrac{425}{1000} = \dfrac{425 \div 25}{1000 \div 25} = \dfrac{17}{40}$

3. (a) 23 paise = ₹ $\dfrac{23}{100}$ = ₹ 0.23   (b) 47 paise = ₹ 0.47

(c) ₹ 35 and 29 paise = ₹ 35 + ₹ $\dfrac{29}{100}$ = ₹ 35 + ₹ 0.29 = ₹ 35.29

(d) ₹ 6 and 19 paise = ₹ 6 + ₹ $\dfrac{19}{100}$ = ₹6 + ₹ 0.19 = ₹ 6.19

(e) ₹5 and 82 paise = ₹ 5 + ₹ $\dfrac{82}{100}$ = ₹ 5 + ₹ 0.82 = ₹ 5.82

(f) ₹ 1113 and 81 paise

$$= ₹\,1113 + \dfrac{81}{100} = ₹\,1113 + ₹\,0.81 = ₹\,1113.81$$

4. (a) 17 m = $\dfrac{17}{1000}$ km = 0.017 km **Ans.**

(b) 96 m = $\dfrac{96}{1000}$ km = 0.096 km **Ans.**

(c) 136 m = $\dfrac{136}{1000}$ km = 0.136 km **Ans.**

(d) 25 km 16 m = 25 km + 16 m = 25 km + $\dfrac{16}{1000}$ km

$\qquad = 25\,km + 0.016\,km = 25.016\,km$ **Ans.**

(e) 288 km 186 m = 288 km + 186 m

$= 288\,km + \dfrac{186}{1000}\,km = 288\ \,km + 0.186\,km = 288.186\,km$ **Ans.**

(f) 418 km 15 m = 418 km + 15 m = 418 km + $\dfrac{15}{1000}$ km

$\qquad = 418\,km + 0.015\,km = 418.015\,km$ **Ans.**

5. (a) 12 g = $\dfrac{12}{1000}$ kg = 0.012 kg **Ans.**

(b) 28 g = $\dfrac{28}{1000}$ kg = 0.028 kg **Ans.**

(c) 1315 g = 1000 g + 315 g = 1 kg + $\dfrac{315}{1000}$ kg $\quad [\because 1000\ gm = 1\,kg]$

$\qquad = 1\,kg + 0.315\,kg = 1.315\,kg$

(d) 19 kg 12 g = 19 kg + 12 g = 19 kg + $\dfrac{12}{1000}$ kg = 19 kg + 0.012 kg

$\qquad = 19.012\,kg$ **Ans.**

(e) 24 kg 168 g = 24 kg + 168 g = 24 kg + $\dfrac{168}{1000}$ kg

$\qquad = 24\,kg + 0.168\,kg = 24.168\,kg$ **Ans.**

(f) 46 kg 20 g = 46 kg + 20 g = 46 kg + $\dfrac{20}{1000}$ kg = 46 kg + 0.020 kg

$\qquad = 46.020\,kg$ **Ans.**

Exercise 6.3

1. (a) 47.06, 28.89, 47.68 and 129.08

```
    4 7 . 0 6
    2 8 . 8 9
    4 7 . 6 8
+ 1 2 9 . 0 8
  2 5 2 . 7 1
```

Hence, the sum of given decimals is 252.41. **Ans.**

(b) 1234.8, 621.87, 35.38, 91.025 and 8.006

```
1 2 3 4 .  8 0
  6 2 1 .  8 7
    3 5 .  3 8
    9 1 . 0 2 5
+    8 . 0 0 6
1 9 9 1 . 0 8 1
```

Hence, the sum of given decimals is 1991.081. **Ans.**

(c) 281.103, 255.655, 266.58, 428.81 and 25.067

```
  2 8 1 . 1 0 3
  2 5 5 . 6 5 5
  2 6 6 . 5 8 0
  4 2 8 . 8 1 0
+  2 5 . 0 6 7
1 2 5 7 . 2 1 5
```

Hence, the sum of given decimals is 1257.215. **Ans.**

(d) 43.289, 245.86, 256.812, 42.006 and 4.5841

```
    4 3 .  2 8 9
  2 4 5 .  8 6
  2 5 6 .  8 1 2
    4 2 .  0 0 6
+    4 . 5 8 4 1
  5 9 2 . 5 5 1 1
```

Hence, the sum of given decimals is 592.5511 **Ans.**

(e) 422.21, 425.87, 436.08, 40.186, 15.607 and 123.897

```
  4 2 2 . 2 1 0
  4 2 5 . 8 7 0
  4 3 6 . 0 8 0
    4 0 . 1 8 6
    1 5 . 6 0 7
+ 1 2 3 . 8 9 7
1 4 6 3 . 8 5 0
```

Hence, the sum of given decimals is 1463.850 **Ans.**

2. Punjab produced the wheat
= 4787025 kg 480 g
= 4787025.480 kg
Rajasthan produced the wheat = 90607926 kg 870 g
= 90607926.870 kg
U.P. produced the wheat
= 48975874 kg 650 g
= 48975874.650 kg
Therefore, the total number of wheat produced by these three states =

```
    4 7 8 7 0 2 5 . 4 8 0  kg
    9 0 6 0 7 9 2 6 . 8 7 0  kg
+ 4 8 9 7 5 8 7 4 . 6 5 0  kg
  1 4 4 3 7 0 8 2 7 . 0 0 0  kg
```

Hence, the total wheat produced 144370827 kg. **Ans.**

3. Mohan purchased a book
= ₹ 438.88
Mohan purchased a pen
= ₹ 62
Mohan purchased a notebook = ₹ 26.18

He pay total money to shopkeeper

= ₹ 438.88 + ₹ 62 + ₹ 26.18

```
  ₹  4 3 8 . 8 8
  ₹     6 2 . 0 0
+ ₹     2 6 . 1 8
  ₹  5 2 7 . 0 6
```

Hence, he pay to shopkeeper ₹ 527.06 **Ans.**

4. Weight of empty gas cylinder = 26 kg 850 g = 26.850 kg

Weight of gas contained in cyclider = 24 kg 650 g = 24.650 kg

The total weight of cylinder = 26.850 kg + 24.650 kg

```
  2 6 . 8 5 0 Kg
+ 2 4 . 6 5 0 Kg
  5 1 . 5 0 0 Kg
```

Hence, the gas in cylinder 51.500 kg. **Ans.**

5. Sushant bought apples = 8 kg 60 g = 8.060 kg

Sushant bought grapes = 8 kg 20 g = 8.020 kg

Sushant bought mangoes = 6 kg 200 g = 6.200 kg

He bought total fruits = 8.060 kg + 8.020 kg + 6.200 kg

```
  8 . 0 6 0 kg
  8 . 0 2 0 kg
+ 6 . 2 0 0 kg
 2 2 . 2 8 0 kg
```

Hence, the total fruits 22.28 kg **Ans.**

6. He cover a distance in first hour = 65 km 635 m = 65.635 km

He cover a distance in second hour = 96 km 25 m = 96.025 km

He cover a distance in third hour = 52 km 9 m = 52.009 km

The length of his journey = 65.635 km + 96.025 km + 52.009 km

```
  6 5 . 6 3 5 km
  9 6 . 0 2 5 km
+ 5 2 . 0 0 9 km
 2 1 3 . 6 6 9 km
```

Hence, the total length of his journey 213.669 km**Ans.**

7. Asley bought cloth for kurta = 4 m 80 cm = 4.80 m

Asley bought cloth for payjama = 2 m 35 cm = 2.35 m

Total length of his cloth = 4.80 m + 2.35 m

```
  4 . 8 0  m
+ 2 . 3 5  m
  7 . 1 5  m
```

Hence, the total length of cloth 7.15 m **Ans.**

8. Reeta bought cloth for her shirt = 4 m 40 cm = 4.40 m

Reeta bought cloth for her trouser = 8 m 5 cm = 8.05 m

The total length of cloth = 4.40 m + 8.05 m

```
  4 . 4 0  m
+ 8 . 0 5  m
 1 2 . 4 5  m
```

Hence, the total length of cloth = 12.45 m **Ans.**

9. Cotton mill made cloth in 2012 = 426490968 m 65 cm

$= 426490968.65$ m

Cotton mill made cloth in 2013 = 634204328 m 37 cm

$= 634204328.37$ m

Cotton mill made cloth in 2014 = 4286355 m 84 cm

$= 4286355.84$ m

The total length of cloth $= 426490968.65 + 634204328.37 + 4286355.84$

$$
\begin{array}{r}
4\,2\,6\,4\,9\,0\,9\,6\,8\,.\,6\,5 \ \text{m} \\
6\,3\,4\,2\,0\,4\,3\,2\,8\,.\,3\,7 \ \text{m} \\
+\quad 4\,2\,8\,6\,3\,5\,5\,.\,8\,4 \ \text{m} \\
\hline
1\,0\,6\,4\,9\,8\,1\,6\,5\,2\,.\,8\,6 \ \text{m}
\end{array}
$$

Hence, the length of cloth in these three years
1064981652.86 m   **Ans.**

10. A country paid for rice in first year = ₹ 88869275.80

A country paid for rice in second year = ₹ 49802989.26
A country paid for rice in third year = ₹ 464180626
The total money spend in these year = ₹ 88869275.80
+ ₹ 4980298926 + ₹ 464180626

$$
\begin{array}{r}
8\,8\,8\,6\,9\,2\,7\,5\,.\,8\,0 \\
4\,9\,8\,0\,2\,9\,8\,9\,.\,2\,6 \\
+\quad 4\,6\,4\,1\,8\,0\,6\,.\,2\,6 \\
\hline
1\,4\,3\,3\,1\,4\,0\,7\,1\,.\,3\,2
\end{array}
$$

Hence, the total money spend in those years = ₹ 14331407132

Ans.

Exercise 6.4

1. (a) $63.4 - 8.545 - 6.33$

Positive number $= 63.4$

Now, add the negative numbers, we get

$$
\begin{array}{r}
8\,.\,5\,4\,5 \\
+\,6\,.\,3\,3\,0 \\
\hline
1\,4\,.\,8\,7\,5
\end{array}
$$

Now, subtracting the sum of negative numbers from the positive number, we get

$$\begin{array}{r} 6\,3\,.\,4\,0\,0 \\ -\,1\,4\,.\,8\,7\,5 \\ \hline 4\,8\,.\,5\,2\,5 \end{array}$$

Hence,
$63.4 - 8.545 - 6.33 = 48.525$
Ans.

(b) $920.5 - 42.74 - 116.86$
$$-246.032$$

Positive number $= 920.5$
Now, we add the negative numbers, we get

$$\begin{array}{r} 4\,2\,.\,7\,4 \\ 1\,1\,6\,.\,8\,6 \\ +\,2\,4\,6\,.\,0\,3\,2 \\ \hline 4\,0\,5\,.\,6\,3\,2 \end{array}$$

Now, subtracting the sum of negative numbers from the positive number, we get

$$\begin{array}{r} 9\,2\,0\,.\,5\,0\,0 \\ -\,4\,0\,5\,.\,6\,3\,2 \\ \hline 5\,1\,4\,.\,8\,6\,8 \end{array}$$

Hence, $920.5 - 42.74 - 116.86$
$-246.032 = 514.868$ **Ans.**

(c) $85.5 - 105.765 + 213.76$
$$-118.9$$

Adding positive numbers and negative numbers separately, we get

$$\begin{array}{r} 8\,5\,.\,5 \\ +\,2\,1\,3\,.\,7\,6 \\ \hline 2\,9\,9\,.\,2\,6 \end{array}$$

$$\begin{array}{r} 1\,0\,5\,.\,7\,6\,5 \\ +\,1\,1\,8\,.\,9\,0\,0 \\ \hline 2\,2\,4\,.\,6\,6\,5 \end{array}$$

Now, subtracting the sum of negative numbers from the positive number, we get

$$\begin{array}{r} 2\,9\,9\,.\,2\,6\,0 \\ -\,2\,2\,4\,.\,6\,6\,5 \\ \hline 7\,4\,.\,5\,9\,5 \end{array}$$

Hence,
$85.5 - 105.765 + 213.76$
$-118.9 = 74.595$ **Ans.**

(d) $1023.6 + 77.84$
$$-56.372 - 908$$

Adding positive numbers and negative numbers seprately, we get

$$\begin{array}{r} 1\,0\,2\,3\,.\,6\,0 \\ +\;\;\,7\,7\,.\,8\,4 \\ \hline 1\,1\,0\,1\,.\,4\,4 \end{array}$$

$$\begin{array}{r} 5\,6\,.\,3\,7\,2 \\ +\,9\,0\,8\,.\,0\,0\,0 \\ \hline 9\,6\,4\,.\,3\,7\,2 \end{array}$$

Now, subtracting the sum of negative numbers from the sum of positive numbers, we get

$$\begin{array}{r} 1\,1\,0\,1\,.\,4\,4\,0 \\ -\,9\,6\,4\,.\,3\,7\,2 \\ \hline 1\,3\,7\,.\,0\,6\,8 \end{array}$$

Hence,
$1023.6 + 77.84 - 56.372$
$-908 = 137.068$ **Ans.**

2. (a) 27.81 from 168.14

$$\begin{array}{r} 1\,6\,8\,.\,1\,4 \\ -\,2\,7\,.\,8\,1 \\ \hline 1\,4\,0\,.\,3\,3 \end{array}$$

Hence,
$168.14 - 27.81 = 140.33$ **Ans.**

(b) 98.92 from 205.64

$$\begin{array}{r} 2\ 0\ 5\ .\ 6\ 4 \\ -\ \ 9\ 8\ .\ 9\ 2 \\ \hline 1\ 0\ 6\ .\ 7\ 2 \end{array}$$

Hence,
$205.64 - 98.92 = 106.72$ **Ans.**

(c) 83.81 from 87.60

$$\begin{array}{r} 8\ 7\ .\ 6\ 0 \\ -\ 8\ 3\ .\ 8\ 1 \\ \hline 3\ .\ 7\ 9 \end{array}$$

Hence, $87.60 - 83.81 = 3.79$
Ans.

(d) 254.8 from 408.70

$$\begin{array}{r} 4\ 0\ 8\ .\ 7\ 0 \\ -2\ 5\ 4\ .\ 8\ 0 \\ \hline 1\ 5\ 3\ .\ 9\ 0 \end{array}$$

Hence,
$408.70 - 254.80 = 153.90$ **Ans.**

(e) 127.48 from 516.3

$$\begin{array}{r} 5\ 1\ 6\ .\ 3\ 0 \\ -1\ 2\ 7\ .\ 4\ 8 \\ \hline 3\ 8\ 8\ .\ 8\ 2 \end{array}$$

Hence,
$516.30 - 127.48 = 388.82$ **Ans.**

(f) ₹ 18.25 from ₹ 20.75

$$\begin{array}{r} ₹\ 2\ 0\ .\ 7\ 5 \\ -₹\ 1\ 8\ .\ 2\ 5 \\ \hline ₹\ \ \ 2\ .\ 5\ 0 \end{array}$$

Hence,
₹ 20.75 − ₹ 18.25 = ₹ 2.50**Ans.**

(g) ₹ 5.36 from ₹ 8.40

$$\begin{array}{r} ₹\ 8\ .\ 4\ 0 \\ -₹\ 5\ .\ 3\ 6 \\ \hline ₹\ 3\ .\ 0\ 4 \end{array}$$

Hence, ₹ 8.40 −₹ 5.36 =₹ 3.04
Ans.

(h) 102.84 m from 450 m

$$\begin{array}{r} 4\ 5\ 0\ .\ 0\ 0 \\ -1\ 0\ 2\ .\ 8\ 4 \\ \hline 3\ 4\ 7\ .\ 1\ 6 \end{array}$$

Hence, 450 m −102.84 m
= 347.16 m **Ans.**

(i) 0.051 km from 1.206 km

$$\begin{array}{r} 1\ .\ 2\ 0\ 6\ \text{km} \\ -\ 0\ .\ 0\ 5\ 1\ \text{km} \\ \hline 1\ .\ 1\ 5\ 5\ \text{km} \end{array}$$

Hence, 1.206 km −0.051 km
= 1.155 km **Ans.**

(j) 0.214 kg from 6.107 kg

$$\begin{array}{r} 6\ .\ 1\ 0\ 7\ \text{kg} \\ -\ 0\ .\ 2\ 1\ 4\ \text{kg} \\ \hline 5\ .\ 8\ 9\ 3\ \text{kg} \end{array}$$

Hence, 6.107 kg −0.214 kg
= 5.893 kg **Ans.**

3. Total weight of vegetables
= 20 kg
Out of this, onions = 4 kg
500 g = 4.500 kg
Out of this, tomatoes = 3 kg
25 g = 3.025 kg
The weight of potatoes = 20
kg −4.500 kg −3.025 kg
= 12.475 kg
Hence, the weight of
potatoes = 12.475 kg **Ans.**

4. Punit purchased rice = 8 kg
600 g = 8.600 kg
Punit purchased sugar = 12
kg 40 g = 12.040 kg
Punit purchased atta = 40 kg
650 g = 40.650 kg
The total weight of his
Purchasing = 8.600 kg
+12.040 kg + 40.650 kg

$$\begin{array}{r} 8.600 \\ 12.040 \\ +40.650 \\ \hline 61.290 \end{array}$$

Hence, the total weight of purchases $= 61.290$ kg   **Ans.**

5. Neetu bought a watermelon $= 8$ kg 400 g $= 8.400$ kg
She gave to her neighbour $= 3$ kg 450 g $= 3.450$ kg
Watermelon left with Neetu $= 8.400$ kg $- 3.450$ kg

$$\begin{array}{r} 8.400 \text{ kg} \\ -3.450 \text{ kg} \\ \hline 4.950 \text{ kg} \end{array}$$

Hence, the watermelon left with Neetu 4.950 kg   **Ans.**

6. Total distance of school from house $= 6$ km 450 m $= 6.450$ km
She travels by foot $= 4$ km 80 m $= 4.080$ km
Distance she travel by bus $= 6.450$ km $- 4.080$ km

$$\begin{array}{r} 6.450 \text{ km} \\ -4.080 \text{ km} \\ \hline 2.370 \text{ km} \end{array}$$

Hence, the distance the travel by bus $= 2.370$ km **Ans.**

7. Ankur had $= ₹ 65$

He bought toffees $= ₹ 60$
Amount he left $= ₹ 65 - ₹ 60$

$$\begin{array}{r} ₹ \ 65 \\ -₹ \ 60 \\ \hline ₹ \ \ 5 \end{array}$$

Hence, ₹ 5 left with him **Ans.**

8. Rahul walked in the morning $= 8$ km 25 m $= 8.025$ km
Rahul walked in the evening $= 4$ km 17 m $= 4.017$ km
He walk in all $= 8.025$ km $+ 4.017$ km

$$\begin{array}{r} 8.025 \text{ km} \\ +4.017 \text{ km} \\ \hline 12.042 \text{ km} \end{array}$$

Hence, the total distance he walked $= 12.042$ **Ans.**

9. Money in bank account $= ₹ 83802925.95$
Firstly, we add the spend money in January and February we get,
It spent in January $= ₹ 38873509.65$
It spent in February $= ₹ 36872919.65$
Total money spent in all $= ₹ 38873509.65$
$+ ₹ 36872919.65$

$$\begin{array}{r} ₹ \ 38873509.65 \\ +₹ \ 36872919.65 \\ \hline ₹ \ 75746429.30 \end{array}$$

Now, we subtracting the spend money from bank money.

$$\begin{array}{r} ₹ \ 83802925.95 \\ -₹ \ 75746429.30 \\ \hline ₹ \ \ 8056496.65 \end{array}$$

Hence, the money still left in the bank $= ₹ 8056496.65$
Ans.

10. A departmental store had stock of sugar $= 6285890$ kg 400 g
$= 6285890.400$ kg
Stock sold on diwali $= 4862512$ kg 885 g $= 4862512.885$ kg
Sugar was left $= 6285890.400$ kg $- 4862512.885$ kg

$$\begin{array}{r} 6\,2\,8\,5\,8\,9\,0\,.\,4\,0\,0 \text{ kg} \\ -\ 4\,8\,6\,2\,5\,1\,2\,.\,8\,8\,5 \text{ kg} \\ \hline 1\,4\,2\,3\,3\,7\,7\,.\,5\,1\,5 \text{ kg} \\ \hline \end{array}$$

Hence, the sugar was left after diwali $= 1423377.515$ kg   **Ans.**

Multiple Choice Questions
1. (i) a   (ii) c   (iii) b   (iv) b   (v) a

7. Ratio, Proportion and Unitary Method

Exercise 7.1
1. (a) 150 cm to 8 m $= 150$ cm : 8×100 cm   [$\because$ 1 m $= 100$ cm]

$= 150$ cm : 800 cm

$= \dfrac{150 \div 50}{800 \div 50}$ ($\because$ HCF of 150 and 800 is 50)

$= \dfrac{3}{16} = 3 : 16$
                                                    Ans.

(b) 6 hours to 45 minutes $= 6 \times 60$ minutes : 45 minutes

[$\because$ 1 hour $= 60$ minutes]

$= 360$ minutes : 45 minutes $= \dfrac{360 \div 45}{45 \div 45}$

[$\because$ HCF of 360 and 45 is 45]

$= \dfrac{8}{1} = 8 : 1$
                                                    Ans.

(c) 80 paise to ₹ 6 $= 80$ paise : 6×100 paise [$\because$ ₹ $1 = 100$ paise]

$= 80$ paise : 600 paise $= \dfrac{80 \div 40}{600 \div 40}$ [$\because$ HCf of 80 and 600 is 40]

$= \dfrac{2}{15} = 2 : 15$
                                                    Ans.

(d) 8 kg to 750 g $= 8 \times 1000$ g : 750 g [$\because$ 1 kg $= 1000$ g]

$= 8000$ g : 750 g $= \dfrac{8000 \div 250}{750 \div 250}$ [$\because$ HCF of 8000 and 750 is 250]

$= \dfrac{32}{3} = 32 : 3$
                                                    Ans.

(e) 190 cm to 1.2 m $= 190 \text{ cm} : 1.2 \text{ m} \times 100 \text{ cm}$

$$[\because 1 \text{ m} = 100 \text{ cm}]$$

$$= 190 \text{ cm} : 120 \text{ cm}$$

$$= \frac{190 \div 10}{120 \div 10} \qquad [\because \text{HCF of 190 and 120 is 10}]$$

$$= \frac{19}{12} = 19 : 12 \qquad \qquad \textbf{Ans.}$$

(f) 4 dozen : 2 codi

$$= 4 \times 12 \text{ to } 2 \times 20 \qquad [\because 1 \text{ dozen} = 12 \text{ and } 1 \text{ codi} = 20]$$

$$= \frac{48 \div 8}{40 \div 8} \qquad \qquad [\because \text{HCF of 48 and 40 is 8}]$$

$$= \frac{6}{5} = 6 : 5 \qquad \qquad \textbf{Ans.}$$

2. (a) $15 : 45 = \dfrac{15 \div 15}{45 \div 15}$ $\qquad [\because \text{HCF of 15 and 45 is 15}]$

$$= \frac{1}{3} = 1 : 3 \qquad \qquad \textbf{Ans.}$$

(b) $32 : 136 = \dfrac{32 \div 8}{136 \div 8}$ $\qquad [\because \text{HCF of 32 and 136 is 8}]$

$$= \frac{4}{17} = 4 : 17 \qquad \qquad \textbf{Ans.}$$

(c) $36 : 90 = \dfrac{36 \div 18}{90 \div 18}$ $\qquad [\because \text{HCF of 36 and 90 is 18}]$

$$= \frac{2}{5} = 2 : 5 \qquad \qquad \textbf{Ans.}$$

(d) $36 : 144 = \dfrac{36 \div 36}{144 \div 36}$ $\qquad [\because \text{HCF of 36 and 144 is 36}]$

$$= \frac{1}{4} = 1 : 4 \qquad \qquad \textbf{Ans.}$$

(e) $45 : 120 = \dfrac{45 \div 15}{120 \div 15}$ $\qquad [\because \text{HCF of 45 and 120 is 15}]$

$$= \frac{3}{8} = 3 : 8 \qquad \qquad \textbf{Ans.}$$

(f) $19 : 95 = \dfrac{19 \div 19}{95 \div 19}$ $\qquad [\because \text{HCF of 19 and 95 is 19}]$

$$= \frac{1}{5} = 1 : 5 \qquad \qquad \textbf{Ans.}$$

(g) $480 : 560 = \dfrac{480 \div 80}{560 \div 80}$ [∵ HCF of 480 and 560 is 80]

$= \dfrac{6}{7} = 6 : 7$ **Ans.**

(h) $2500 : 1250 = \dfrac{2500 \div 1250}{1250 \div 1250}$

[∵ HCF of 2500 and 1250 is 1250]

$= \dfrac{2}{1} = 2 : 1$ **Ans.**

3. (a) $\dfrac{24}{20} = \dfrac{6}{5}$ (b) $\dfrac{25}{40} = \dfrac{5}{8}$ (c) $\dfrac{25}{50} = \dfrac{5}{10}$ (d) $\dfrac{72}{136} = \dfrac{36}{68}$

4. (a) 2 : 3 or 1 : 8

Making the denominator of each of the fraction equal,

$\dfrac{2}{3} = \dfrac{2 \times 8}{3 \times 8} = \dfrac{16}{24}$ and $\dfrac{1}{8} = \dfrac{1 \times 3}{8 \times 3} = \dfrac{3}{24}$

∵ $16 > 3$

∴ $\dfrac{16}{24} > \dfrac{3}{24}$ Hence, 2 : 3 > 1 : 8   **Ans.**

(b) 4 : 8 or 7 : 12

Making the denominator of each of the fraction equal,

$\dfrac{4}{8} = \dfrac{4 \times 3}{8 \times 3} = \dfrac{12}{24}$ and $\dfrac{7}{12} = \dfrac{7 \times 2}{12 \times 2} = \dfrac{14}{24}$

∵ $12 < 14$

∴ $\dfrac{12}{24} < \dfrac{14}{24}$ Hence, 4 : 8 < 7 : 12 or 7 : 12 > 4 : 8   **Ans.**

(c) 4 : 7 or 2 : 8

Making the denominator of each of the fraction equal,

$\dfrac{4}{7} = \dfrac{4 \times 8}{7 \times 8} = \dfrac{32}{56}$ and $\dfrac{2}{8} = \dfrac{2 \times 7}{8 \times 7} = \dfrac{14}{56}$

∵ $32 > 14$

∴ $\dfrac{32}{56} > \dfrac{14}{56}$ Hence, 4 : 7 > 2 : 8   **Ans.**

(d) 1 : 4 or 3 : 16

Making the denominator of each of the fraction equal,

$\dfrac{1}{4} = \dfrac{1 \times 4}{4 \times 4} = \dfrac{4}{16}$ and $\dfrac{3}{16} = \dfrac{3 \times 1}{16 \times 1} = \dfrac{3}{16}$

∵ $4 > 3$

          Progress With Maths-6

$\therefore$ $\quad\quad\quad\quad\quad\quad\dfrac{4}{16} > \dfrac{3}{16}$ Hence, $1:4 > 3:16$

Ans.

5. (a) Sakshi scored in Hindi $= 70$

Kiran scored in Hindi $= 60$

Ratio of Sakshi and Kiran score $= 70 : 60 = \dfrac{70}{60}$

$\quad\quad\quad = \dfrac{70 \div 10}{60 \div 10}$ [$\because$ HCF of 70 and 60 is 10]

$\quad\quad\quad = \dfrac{7}{6} = 7 : 6$

(b) Sakshi scored in English $= 50$

Kiran scored in English $= 36$

Ratio of Sakshi and Kiran score $= 50 : 36 = \dfrac{50}{36}$

$\quad\quad\quad = \dfrac{50 \div 2}{36 \div 2}$ [$\because$ HCF of 50 and 36 is 2]

$\quad\quad\quad = \dfrac{25}{18} = 25 : 18$

Ans.

6. (a) Income $=$ ₹ 15000 per month

Expanditure $=$ ₹ 3000 per month

Ratio $= \dfrac{\text{Income}}{\text{Expenditure}} = \dfrac{15000}{3000}$

$\quad\quad = \dfrac{15000 \div 3000}{3000 \div 3000}$ [$\because$ HCF of 15000 and 3000 is 3000]

$\quad\quad = \dfrac{5}{1} = 5 : 1$

Ans.

(b) Expenditure $= 3000$ per month

Saving $=$ Income $-$ Expenditure

$\quad\quad =$ ₹15000 $-$ ₹3000 $=$ ₹12000

Ratio $= \dfrac{\text{Expenditure}}{\text{Saving}} = \dfrac{₹3000}{₹12000}$

$\quad\quad = \dfrac{3000 \div 3000}{12000 \div 3000}$ [$\because$ HCF of 3000 and 12000 is 3000]

$\quad\quad = \dfrac{1}{4} = 1 : 4$

Ans.

7. The length of rectangular field $= 54\,\text{m}$

The breadth of rectangular field $= 18\,\text{m}$

$$\text{Ratio} = \frac{\text{length}}{\text{breadth}} = \frac{54}{18}$$

$$= \frac{54 \div 18}{18 \div 18} \;[\because \text{HCF of 54 and 18 is 18}]$$

$$= \frac{3}{1} = 3:1 \qquad \qquad \textbf{Ans.}$$

8. There are boys in school $= 900$

There are girls in schools $= 480$

$$\text{Ratio} = \frac{\text{boys}}{\text{girls}} = \frac{900}{480}$$

$$= \frac{900 \div 60}{480 \div 60} \;[\because \text{HCF of 900 and 480 is 60}]$$

$$= \frac{15}{8} = 15:8 \qquad \qquad \textbf{Ans.}$$

9. The length of flag $= 72\,\text{cm}$

The breadth of flag $= 48\,\text{cm}$

$$\text{Ratio} = \frac{\text{length of flag}}{\text{breadth of flag}} = \frac{72}{48}$$

$$= \frac{72 \div 24}{48 \div 24} \;[\because \text{HCF of 72 and 48 is 24}]$$

$$= \frac{3}{2} = 3:2 \qquad \qquad \textbf{Ans.}$$

10. The height of Neeraj $= 140\,\text{cm}$

The height of his son $= 70\,\text{cm}$

$$\text{Ratio} = \frac{\text{height of Neeraj}}{\text{height of his son}} = \frac{140}{70}$$

$$= \frac{140 \div 70}{70 \div 70} \qquad [\because \text{HCF of 140 and 70 is 70}]$$

$$= \frac{2}{1} = 2:1 \qquad \qquad \textbf{Ans.}$$

Exercise 7.2

1. (a) 7, 21, 5, 15   (b) 12, 24, 24, 48

    (c) 30, 40, 45, 60   (d) 16, 20, 24, 30

2. (a) 1, 4, 24, 48

$$1 : 4 = \frac{1 \div 1}{4 \div 1} = \frac{1}{4} \text{ and } 24 : 48 = \frac{24 \div 24}{48 \div 24} = \frac{1}{2}$$

$\because \quad \dfrac{1}{4} \neq \dfrac{1}{2}$ or $1 : 4 \neq 24 : 48$

Hence, 1, 4, 24, 48 are not in proportion.　　　　**Ans.**

(b) 50, 35, 25, 50

$$50 : 35 = \frac{50 \div 5}{35 \div 5} = \frac{10}{7} \text{ and } 25 : 50 = \frac{25 \div 25}{50 \div 25} = \frac{1}{2}$$

$\because \qquad \dfrac{10}{7} \neq \dfrac{1}{2}$

$\therefore \qquad 10 : 7 \neq 1 : 2$

Hence, 50, 35, 25, 50 are not in proportion.　　　　**Ans.**

(c) 25, 18, 45, 54

$$25 : 18 = \frac{25 \div 1}{18 \div 1} = \frac{25}{18} \text{ and } 45 : 54 = \frac{45 \div 9}{54 \div 9} = \frac{5}{6}$$

$\because \qquad \dfrac{25}{18} \neq \dfrac{5}{6}$

$\therefore \qquad 25 : 18 \neq 5 : 6$

Hence, 25, 18, 45, 54 are not in proportion.　　　　**Ans.**

(d) 60, 50, 24, 30

$$60 : 50 = \frac{60 \div 10}{50 \div 10} = \frac{6}{5} \text{ and } 24 : 30 = \frac{24 \div 6}{30 \div 6} = \frac{4}{5}$$

$\because \qquad \dfrac{6}{5} \neq \dfrac{4}{5}$

$\therefore \qquad 6 : 5 \neq 4 : 5$

Hence, 60, 50, 24, 30 are not in proportion.　　　　**Ans.**

(e) 66, 65, 22, 13

$$66 : 65 = \frac{66 \div 1}{65 \div 1} = \frac{66}{65} \text{ and } 22 : 13 = \frac{22 \div 1}{13 \div 1} = \frac{22}{13}$$

$\because \qquad \dfrac{66}{65} \neq \dfrac{22}{13}$

$\therefore \qquad 66 : 65 \neq 22 : 13$

Hence, 66, 65, 22, 13 are not in proportion.　　　　**Ans.**

(f) 24, 25, 42, 48

$$24 : 25 = \frac{24 \div 1}{25 \div 1} = \frac{24}{25} \text{ and } 42 : 48 = \frac{42 \div 6}{48 \div 6} = \frac{7}{8}$$

$$\because \qquad\qquad \frac{24}{25} \neq \frac{7}{8}$$

$$\therefore \qquad\qquad 24 : 25 \neq 7 : 8$$

Hence, 24, 25, 42, 48 are not in proportion.　　**Ans.**

3. Let the fourth term $= x$

Then, 16, 32, 25 and x will be in proportion.

$16 : 32 :: 25 : x$

$$\text{or } 16 \times x = 32 \times 25 \text{ or } x = \frac{32 \times 25}{16} = 50$$

$$\therefore \qquad\qquad x = 50$$

Hence, the fourth term is 50.　　**Ans.**

4. There is ratio of $= \dfrac{\text{Distance between Delhi to Chandigarh}}{\text{Distance between Delhi to Saharanpur}} = \dfrac{1}{7}$

If, the distance between Delhi to Saharanpur $= 490\,\text{km}$

$$\dfrac{\text{Distance between Delhi to Chandigarh}}{490\,\text{km}}$$

or Distance between Delhi to Chandigarh $= \dfrac{490}{7}\,\text{km} = \dfrac{490 \div 7}{7 \div 7}$

Distance between Delhi to Chandigarh $= 70\,\text{km}$

Thus, the distance between Delhi to Chandigarh $= 70\,\text{km}$　　**Ans.**

5. The total plants planted $= 2500$

The ratio of boys and girls $= 2 : 3$

So, $\qquad \dfrac{\text{The ratio of boys}}{\text{The ratio of girls}} = \dfrac{2}{3}$

The total of ratio $= 2 + 3 = 5$

$\because$ The plants planted by boys $= \text{Total plants} \times \dfrac{\text{ratio of boys}}{\text{Total of ratio}}$

$$= 2500 \times \frac{2}{5} = 1000$$

$\because$ The plants planted by girls $= \text{Total plants} \times \dfrac{\text{ratio of girls}}{\text{Total of ratio}}$

$$= 2500 \times \frac{3}{5} = 1500$$

Thus, the boys planted 1000 plants and the girls planted 1500 pants.　　**Ans.**

6. The ratio of sugar and besan $= 2 : 5$

If, the sugar used $= 42$ kg
The quantity of besan $= ?$
Let the besan quantity $= x$

So, $2 : 5 = 42 \times x$ or $2 \times x = 5 \times 42$ or $x = \dfrac{42 \times 5}{2}$

$x = 21 \times 5$ or $x = 105$ kg

Hence, the quantity of besan $= 105$ kg **Ans.**

7. If 16, x and 9 in continued proportion, then

$16 : x :: x : 9$

or $16 \times 9 = x \times x$ or $x^2 = 16 \times 9$ or $x^2 = 144$ or $x = \sqrt{144}$

$\therefore x = 12$

Hence, the value of $x = 12$ **Ans.**

8. Let the third term $= x$

$25 : 45 :: x : 54$ or $25 \times 54 = 45 \times x$ or $x = \dfrac{25 \times 54}{45}; x = 30$

Hence, the third term is 30. **Ans.**

9. $x : 14 :: 20 : 56$

$x \times 56 = 14 \times 20$ or $x = \dfrac{14 \times 20}{56}; x = 5$

Thus, the value of x is 5. **Ans.**

10. $24 : x :: 16 : 28$

$24 \times 28 = x \times 16$ or $x = \dfrac{24 \times 28}{16}; x = 42$

Thus, the value of $x = 42$ **Ans.**

11. $9 : 15 :: 15 : x$

$9 \times x = 15 \times 15$ or $x = \dfrac{15 \times 15}{9}; x = 25$

Thus, the value of $x = 25$ **Ans.**

12. $32 : x :: x : 8$

$32 \times 8 = x \times x$ or $x^2 = 32 \times 8; x^2 = 256; x = \sqrt{256}; x = 16$

Thus, the value of $x = 16$ **Ans.**

13. $6 : 18 :: x : 15; 6 \times 15 = 18 \times x$ or $x = \dfrac{6 \times 15}{18}; x = 5$

Thus, the value of $x = 5$ **Ans.**

Exercise 7.3

1. $\because$ The cost of 1 dozen pens = ₹ 288

   $\therefore$ The cost of 1 pen $= \dfrac{₹\ 288}{12}$ = ₹ 24

   $\therefore$ The cost of 320 pens = ₹ 24×320 = ₹ 7680

   Hence, the cost of 320 pens = ₹ 7680   **Ans.**

2. $\because$ Scooter runs 70 km on = 2 ltr petrol

   $\therefore$ Scooter runs 1 km on $= \dfrac{2\ \text{ltr}}{70}$ = .028 ltr

   $\therefore$ Scooter runs 105 km on = .028 ltr $\times 105$ = 2.94 ltr or 3 ltr

   Hence, the scooter runs 105 km in = 3 ltr petrol   **Ans.**

3. $\because$ The weight of 64 books = 8 kg

   $\therefore$ The weight of 1 book $= \dfrac{8}{64}$ kg = 0.125 kg

   $\therefore$ The weight of 32 books = 0.125×32 kg = 4 kg

   Hence, the weight of 32 books = 4 kg   **Ans.**

4. $\because$ The cost of 5 copies = ₹ 12.50

   $\therefore$ The cost of 1 copy $= \dfrac{₹\ 12.50}{5}$ = ₹ 2.50

   $\therefore$ The cost of 7 copies = ₹ 2.50×7 = ₹ 17.50

   Hence, the cost of 7 copies = ₹ 17.50   **Ans.**

5. $\because$ Train travel in 3 hours = 240 km

   $\therefore$ Train travel in 1 hour $= \dfrac{240}{3}$ km = 80 km

   $\therefore$ Train travel in 8 hours = 80 km $\times$ 8 = 640 km

   Hence, the train travel 640 km in 8 hours.   **Ans.**

6. $\because$ The cost of 4 television = ₹ 25350

   $\therefore$ The cost of 1 television = ₹ $\dfrac{25350}{4}$ = ₹ 6337.5

   $\therefore$ The cost of 28 television = ₹ 6337.5×28 = ₹ 177450

   Hence, the cost of 28 televisions = ₹ 177450   **Ans.**

7. $\because$ The provision for 900 students = 45 days

   $\therefore$ The provision for 1 student = 45×900 = 40500 days

   $\therefore$ The provision for 900 student after 30 days= $(900 - 150)$ = 750

   or $900 \times 30 + 750 \times x = 40500$

   or $27000 + 750x = 40500$

or $750x = 40500 - 27000$ or $750x = 13500$

$\qquad x = 18$

Hence, the provision for remaining 750 students $= 18$ days. **Ans.**

8. ∵ There are food available for 320 scout guides $= 5$ days

∴ There are food available for 1 scout guide $= 5 \times 320$

∴There are food available for 400 scout guides $= \dfrac{5 \times 320}{400}$

$= 4$ days

Hence, the food available for 400 scout guides $= 4$ days. **Ans.**

9. ∵ A journey travel by aeroplane in 9 hours $= 1260$ km/h

∴A journey travel by aeroplane 1 hour $= 1260 \times 9$ km/h

∴A journey travel by aeroplane 5 hours $= \dfrac{1260 \times 9}{5} = 2268$ km/h

The speed increased by aeroplane $= 2268$ km/h $- 1260$ km/h

$= 1008$ km/h

Hence, the speed increased $= 1008$ km/h **Ans.**

10. ∵ 10 worker completed a piece of work $= 27$ days

∴1 worker complete that work $= 10 \times 27$ days

∴ 18 worker complete that work $= \dfrac{10 \times 27}{18}$ days $= 15$ days

Hence, 18 worker complete that work $= 15$ days. **Ans.**

11. ∵ 282 quintal of wheat crop required field $= 2$ hectare

∴1 quintal of wheat crop required field $= \dfrac{2}{282}$ hectare

∴564 quintal of wheat crop required field $= \dfrac{2 \times 564}{282}$ hectare

$= 4$ hectare

Hence, 564 quintal wheat crop required a field $= 4$ hectare **Ans.**

12. ∵ The capacity of 160 l/hr fill the tank $= 10$ hours

∴The capacity of 1 l/hr fill the tank $= 10 \times 160$

∴The capacity of 200 l/hr fil the tank $= \dfrac{10 \times 160}{200} = 8$ hours

Hence, the capacity of 200 l/hr to fill the tank $= 8$ hours **Ans.**

13. ∵ A dealer appoint worker on ₹ 1680 per day $= 28$ workers

∴A dealer appointed worker on ₹ 1 per day $= \dfrac{28}{1680}$ worker

$\therefore$A dealer appointed worker on ₹ 1260 per day $= \dfrac{1260 \times 28}{1680} = 21$ workers

Hence, the ₹ 1260 per day $= 21$ workers **Ans.**

14. $\because$ A driver drive a car 40 km/h reached a place $= 6$ hours

$\therefore$Driver drive a car 1 km/h reached a place $= 40$ km/h $\times 6$ hour

$\therefore$Driver drive a car 120 km/h reached a place $= \dfrac{40 \times 6}{120} = 2$ hours

Hence, the driver drive a car 120 km/h reached a place in $= 2$ hours. **Ans.**

15. $\because$ A road build in 70 days by the $= 110$ workers

$\therefore$A road build in 1 day by the $= 70 \times 110$ workers

$\therefore$A road build in 35 days by the $= \dfrac{70 \times 110}{35}$ workers

$\qquad\qquad\qquad\quad = 220$ workers

Hence, a road build in 35 days by the $= 220$ workers **Ans.**

Multiple Choice Questions

1. (i) b (ii) b (iii) c (iv) c (v) c

8. Introduction to Algebra

Exercise 8.1

1. (a) 13 less than the quotient of x and $y = \dfrac{x}{y} - 13$

   Ans.

   (b) 7 less than the product of x by $y = xy - 7$ **Ans.**

   (c) 62 more than the double of $x = 2x + 62$ **Ans.**

   (d) Subtract x from $4y = 4y - x$ **Ans.**

   (e) Subtracted $5x$ from one-third of $y = \dfrac{1}{3}y - 5x$

   Ans.

   (f) 6 more than $x = x + 6$ **Ans.**

   (g) 15 less than $y = y - 15$ **Ans.**

   (h) 18 more than $\dfrac{x}{2} = \dfrac{x}{2} + 18$

   Ans.

2. (a) $a \times a \times a \times a \times ..... 22$ time $= a^{22}$ **Ans.**

   (b) $24 \times x \times x \times x \times x \times y \times y \times y \times y \times y \times y \times y = 24x^4 y^7$ **Ans.**

   (c) $9a^3 \times 5ab^2 \times bc^2 = 45a^4 b^3 c^2$ **Ans.**

   (d) $6x^2 y^3 \times 3x^2 \times 3y^2 = 54x^4 y^5$ **Ans.**

3. (a) $x^2 y^3 = x \times x \times y \times y \times y$ **Ans.**

(b) $15a^5 = 3 \times 5 \times a \times a \times a \times a \times a$ **Ans.**

(c) $27a^3 b^3 = 3 \times 3 \times 3 \times a \times a \times a \times b \times b \times b$ **Ans.**

(d) $20x^2 y^3 z = 2 \times 2 \times 5 \times x \times x \times y \times y \times y \times z$ **Ans.**

(e) $4y^4 = 2 \times 2 \times y \times y \times y \times y$ **Ans.**

(f) $8a^2 b^4 c = 2 \times 2 \times 2 \times a \times a \times b \times b \times b \times b \times c$ **Ans.**

4. Sonu scored in English $= 24$ marks more than the $\dfrac{2}{3}$ marks of

Hindi

He scored in Hindi $= x$

So, he scored in English $= x \times \dfrac{2}{3} + 24 = \dfrac{2x}{3} + 24$

Hence, the marks he scored in English $= \dfrac{2x}{3} + 24$ **Ans.**

5. Seema scored in Maths $= x$

Reena scored in maths $= y$

Beena scored in Maths $= \dfrac{1}{2}(x + y)$

Hence, Beena scored in maths $= \dfrac{1}{2}(x + y)$ **Ans.**

6. Amit scored in hockey match $= x$

Sumit scored goal in hockey match $= y$

They scored goal together $= x + y$

Hence, they goal together $= x + y$ **Ans.**

7. Sachin scored $= x$ runs

Double of Sachin scored $= 2x$

Nehra scored $= 2x - 8$

Hence, Nehra scored $= 2x - 8$ **Ans.**

8. In a garden there are rows $= 4x$

Each row has trees in the garden $= 4x \times x^2 = 4x^3$

Hence, the total number of trees in the garden $= 4x^3$ **Ans.**

Exercise 8.2

1. (a) $4x^2 y^2 - 9y^2 x^2$

In $4x^2 y^2$ and $-9y^2 x^2$, x and y are literal co-efficient which are same.

Hence, these are like term. **Ans.**

(b) $8x^2y^2, 12xy^2$

In $8x^2y$ and $12xy^2$, x and y are literal co-efficience which are not same

Hence, these are unlike terms. **Ans.**

(c) $28a^2b^2, 20a^2b^2$

In $28a^2b^2$ and $20a^2b^2$, a and b are literal co-efficient which are same.

Hence, these are like terms. **Ans.**

(d) $25a^2bc^2, 7abc^2$

In $25a^2bc^2$ and $7abc^2$, a and b are literal co-efficent which are not same.

Hence, these are unlike terms. **Ans.**

(e) $9xy, \dfrac{12}{5}yx$

In $9xy$ and $\dfrac{12}{5}yx$, x and y are literal co-efficient which are

same.

Hence, these are like terms. **Ans.**

(f) $\dfrac{4}{3}x^2yz, 6zxy^2$

In $\dfrac{4}{3}x^2yz$ and $6zxy^2$, x and y are literal co-efficient which

are not same.

Hence, these are unlike terms. **Ans.**

2. (a) $45y = (45)y$

Hence, in $45y$, co-efficient of y is 45. **Ans.**

(b) $9xy = (9x)y$

Hence, in $9xy$, co-efficient of y is $9x$. **Ans.**

(c) $12x + 7y$

In $12x + 7y$, the term of y is $7y$.

Hence, in $12x + 7y$, co-efficient of y is 7. **Ans.**

(d) $-19yzx + 21$

In $-19yzx + 21$, the term of y is $-19yzx$.

Hence, in $-19yzx + 21$, co-efficient of y is $-19zx$ **Ans.**

(e) $\dfrac{-2}{3}yx + 15$

In $\dfrac{-2}{3}yx+15$, the term of y is $\dfrac{-2}{3}yx$

Hence, in $\dfrac{-2}{3}yx+15$, co-efficient of y is $\dfrac{-2}{3}x$ **Ans.**

(f) $26ay=(26a)y$

Hence, in $26ay$, co-efficient of y is $26a$ **Ans.**

3. (a) $13x^4$ is a monomial, because it has one term. **Ans.**

(b) $12x^9+5y^3$ is a binomial, because it has two terms.

(c) 17 is a monomial, because it has one term. **Ans.**

(d) $15x-3y+2z$ is a trinomial, because it has three terms. **Ans.**

(e) $25x$ is a monomial, because it has one term. **Ans.**

(f) $2xy-3$ is a binomial, because it has two terms. **Ans.**

4. (a) $4yzx=(4yz)x$

Hence, in $4yzx$, co-efficient of x is $4yz$ **Ans.**

(b) $-9yx+17$

In $-9yx+17$, the term of x is $-9yx$

Hence, in $-9yx+17$, the co-efficient x is $-9y$ **Ans.**

(c) $2xy^2z^4=(2y^2z^4)-x$

Hence, in $2xy^2z^4$, co-efficient of x is $2y^2z^4$. **Ans.**

(d) $\dfrac{-2}{5}x+18$ $\qquad$ In $\dfrac{-2}{5}x+18$, the term of x is $\dfrac{-2}{5}x$.

Hence, in $\dfrac{-2}{5}x+18$, co-efficient of x is $\dfrac{-2}{5}$ **Ans.**

(e) $\dfrac{-3}{7}xy^4z^6=\left(\dfrac{-3}{7}y^4z^6\right)x$

Hence, in $\dfrac{-3}{7}xy^4z^6$, co-efficient of x is $\dfrac{-3}{7}y^4z^6$ **Ans.**

(f) $4ax=(4a)x$

Hence, in $4ax$, co-efficient of x is $4a$ **Ans.**

Exercise 8.3

1. (a) $3x-4y+2z$ from $9x-2y-z$

$9x-2y-z$
$3x-4y+2z$
$\underline{-\quad+\quad-}$
$\overline{6x+2y-3z}$

(b) $-4xy + 6yz$ from $8xy - 20yz$

$\quad 8xy - 20yz$

$\quad -4xy + 6yz$

$\quad \underline{+\qquad -}$

$\quad 12xy - 26yz$

(c) $6a - 4b + 2c$ from $-4b - 60c + 2a$ or $2a - 4b - 60c$

Now,

$\qquad 2a - 4b - 60c$

$\qquad 6a - 4b + 2c$

$\qquad \underline{-\quad + \quad -}$

$\qquad -4a \;-\; 62c$

(d) $16x - 2y - 18z + 8$ from $21x - 13y + 4z$

$\qquad 21x - 13y + 4z$

$\qquad 16x - 2y - 18z + 8$

$\qquad \underline{-\quad + \quad + \quad -}$

$\qquad 5x - 11y + 22z - 8$

2. (a) $6a^2 + 4b - 2c + 9a^2 + 4b + 8c + 6a^2 - 2b + 4c$

$\quad = 6a^2 + 9a^2 + 6a^2 + 4b + 4b - 2b - 2c + 8c + 4c$

$\quad = (6 + 9 + 6)a^2 + (4 + 4 - 2)b + (-2 + 8 + 4)c$

$\quad = 21a^2 + 6b + 10c$ **Ans.**

(b) $13x^2 - x + 17 - 6 + 8x - 4x^2 + 2x^2 - 4x + 1$

$\quad = 13x^2 - 4x^2 + 2x^2 - x + 8x - 4x + 17 - 6 + 1$

$\quad = (13 - 4 + 2)x^2 + (-1 + 8 - 4)x + (17 - 6 + 1)$

$\quad = 11x^2 + 3x + 12$ **Ans.**

(c) $xy - yz + yz - zx + zx - xy$

$\quad = xy - xy - yz + yz - zx + zx = 0$ **Ans.**

(d) $6x^2 - 2 - 6x + 4x^3 - 2x + 3x^2 + 18x - 2x^3 + 4$

$\quad = 4x^3 - 2x^3 + 6x^2 + 3x^2 - 6x - 2x + 18x - 2 + 4$

$\quad = (4 - 2)x^3 + (6 + 3)x^2 + (-6 - 2 + 18)x + (-2 + 4)$

$\quad = 2x^3 + 9x^2 + 10x + 2$

3. (a) Sum of $13x, 25x, 18x = 13x + 25x + 18x = (13 + 25 + 18)x$

$\qquad\qquad\qquad\qquad = 56x$ **Ans.**

(b) Sum of $8xy, 9xy, 2xy = 8xy + 9xy + 2xy = (8 + 9 + 2)xy = 19xy$

$\qquad\qquad\qquad\qquad\qquad\qquad$ **Ans.**

(c) Sum of $6abc, -2abc, 4abc, abc$

$\quad = 6abc + (-2abc) + 4abc + abc$

$\quad = 6abc - 2abc + 4abc + abc = (6 - 2 + 4 + 1)abc = 9abc$ **Ans.**

(d) Sum of $-22a^2bc$, $47a^2bc$, $6a^2bc$

$$=-22a^2bc+47a^2bc+6a^2bc$$
$$=(-22+47+6)a^2bc=31a^2bc$$ **Ans.**

(e) Sum of $-26x^2y^2$, $-4x^2y^2$, $-9x^2y^2$

$$=-26x^2y^2+(-4x^2y^2)+(-9x^2y^2)$$
$$=-26x^2y^2-4x^2y^2-9x^2y^2=(-26-4-9)x^2y^2$$
$$=-39x^2y^2$$ **Ans.**

(f) Sum of $9a^2$, $-6a^2$, $-12a^2$, $12a^2$

$$=9a^2+(-6a^2)+(-12a^2)+12a^2$$
$$=9a^2-6a^2-12a^2+12a^2=3a^2$$ **Ans.**

4. (a) $20x^2-26x^2=(20-26)x^2=-6x^2$ **Ans.**

(b) $52x^2y^2-68x^2y^2=(52-68)x^2y^2=-16x^2y^2$ **Ans.**

(c) $-13xy-9xy=(-13-9)xy=-22xy$ **Ans.**

(d) $-10p^2qr-(-5p^2qr)=(-10+5)p^2qr=-5p^2qr$ **Ans.**

5. (a) $12x-3y+14z$, $5x+12y-15z$

$$12x-3y+14z$$
$$+5x+12y-15z$$
$$\overline{17x+9y-z}$$ **Ans.**

(b) $24a-25b+19c,-a+b-17c,12a-4b+2c$

$$24a-25b+19c$$
$$-a+b-17c$$
$$+12a-4b+2c$$
$$\overline{35a-28b+4c}$$ **Ans.**

(c) $16x^3+15x^2y+26xy^2-12y^3$, $4x^3-3xy^2-6x^2y$,
$$y^3-2x^3+9xy^2$$

$$16x^3+15x^2y+26xy^2-12y^3$$
$$4x^3-6x^2y-3xy^2+0$$
$$-2x^3+0+9xy^2+y^3$$
$$\overline{18x^3+9x^2y+32xy^2-11y^3}$$ **Ans.**

(d) $4x-2y+z, 2y-2x+3z, 2z-8x-3y, 3y-2z$

$$4x-2y+z$$
$$-2x+2y+3z$$
$$-8x-3y+2z$$
$$+\quad+3y-2z$$
$$\overline{-6x+0+4z}\text{ or }-6x+4z$$ **Ans.**

6. $a = 3, b = 2$ and $c = 5$

(a) $4a^2 - 2b^2 + 4c = 4 \times (3)^2 - 2 \times (2)^2 + 4 \times 5$

$= 4 \times 9 - 2 \times 4 + 4 \times 5 = 36 - 8 + 20 = 48$ **Ans.**

(b) $8a^3 + 3b^3 - 9c^3 = 8 \times (3)^3 + 3 \times (2)^3 - 9 \times (5)^3$

$= 8 \times 27 + 3 \times 8 - 9 \times 125 = 216 + 24 - 1125 = 885$ **Ans.**

7. $x = 2, y = 3$ and $z = -4$

(a) $6xy^2 - 25x^2 y + zx = 6 \times 2(3)^2 - 25 \times (2)^2 \times 3 + (-4) \times 2$

$= 6 \times 2 \times 9 - 25 \times 4 \times 3 + (-4) \times 2$

$= 108 - 300 - 8 = -200$ **Ans.**

(b) $6x^3 + 3y^3 + 2z^3 + 9xyz$

$= 6 \times (2)^3 + 3 \times (3)^3 + 2 \times (-4)^3 + 9 \times 2 \times 3 \times (-4)$

$= 6 \times 8 + 3 \times 27 + 2 \times (-64) + 36 \times (-4)$

$= 48 + 81 - 128 - 216 = -215$ **Ans.**

8. $A = 4x^2 - 6x + 2$

$B = 8x^2 + 4x - 2$ and $C = 9x^2 - 2x + 8$

Value of, $A + B - C$

Put the value in this,

$= (4x^2 - 6x + 2) + (8x^2 + 4x - 2) - (9x^2 - 2x + 8)$

$= 4x^2 - 6x + 2 + 8x^2 + 4x - 2 - 9x^2 + 2x - 8$

$= 4x^2 + 8x^2 - 9x^2 - 6x + 4x + 2x + 2 - 2 - 8$

$= (4 + 8 - 9)x^2 + (-6 + 4 + 2)x + (2 - 2 - 8)$

$= 3x^2 + 0x - 8 = 3x^2 - 8$ **Ans.**

9. $2x^2 + 2xy - 2y^2$

           $3x^2 - 3xy + 5y^2$

         $\underline{\quad - \qquad + \qquad - \quad}$

         $\underline{-x^2 + 5xy - 7y^2}$

Hence, we must be added $= -x^2 + 5xy - 7y^2$.   **Ans.**

10. First by we find the sum of these

        $6x^2 - 3xy + 15y^2$

       $+ 4x^2 + 6xy + 3y^2$

       $\underline{10x^2 + 3xy + 18y^2}$

Then, we subtract $6x^2 + 2xy + 8y^2$ from this.

       $10x^2 + 3xy + 18y^2$

       $6x^2 + 2xy + 8y^2$

      $\underline{\quad - \qquad - \qquad - \quad}$

      $\underline{4x^2 + xy + 10y^2}$

Hence, we subtract $4x^2 + xy + 10y^2$ **Ans.**

11.
$$+13x^2 - 2xy + 2y^2$$
$$-6x^2 - 12xy - 2y^2$$
$$\underline{\quad + \qquad + \qquad + \quad}$$
$$19x^2 + 10xy + 4y^2$$

Hence, we subtract $19x^2 + 10xy + 4y^2$.   **Ans.**

12. Sum of $6a + 3b + 4c$ and $4a - 2b + 15c$
$$6a + 3b + 4c$$
$$\underline{+ \, 4a - 2b + 15c}$$
$$10a + b + 19c$$

Then, we subtract $9a + 2b - 4c$ from $10a + b + 19c$.
$$10a + b + 19c$$
$$9a + 2b - 4c$$
$$\underline{\quad - \qquad - \qquad + \quad}$$
$$a - b + 23c$$

Hence, we set $a - b + 23c$ **Ans.**

Exercise 8.4

1. $x + 17 = 3$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Value of LHS	Value of RHS
0	$0 + 17 = 17$	3
-1	$-1 + 17 = 16$	3
-2	$-2 + 17 = 15$	3
-3	$-3 + 17 = 14$	3
-4	$-4 + 17 = 13$	3
-5	$-5 + 17 = 12$	3
-6	$-6 + 17 = 11$	3
-7	$-7 + 17 = 10$	3
-8	$-8 + 17 = 9$	3
-9	$-9 + 17 = 8$	3
-10	$-10 + 17 = 7$	3
-11	$-11 + 17 = 6$	3
-12	$-12 + 17 = 5$	3
-13	$-13 + 17 = 4$	3
-14	$-14 + 17 = 3$	3

Thus, we see that for $x = -14$, LHS = RHS

Hence, $x = -14$ is the solution of given equation. **Ans.**

(b) $4x + 2 = 10$

To find the values of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Values of LHS	Given the Value of RHS
0	$4 \times 0 + 2 = 2$	10
1	$4 \times 1 + 2 = 6$	10
2	$4 \times 2 + 2 = 10$	10

Thus, we see that for $x = 2$, LHS = RHS

Hence, $x = 2$ is the solution of given equation. **Ans.**

(c) $2x - 1 = 11$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the value of x.

x	Value of LHS	Given the value of RHS
0	$2 \times 0 - 1 = -1$	11
1	$2 \times 1 - 1 = 1$	11
2	$2 \times 2 - 1 = 3$	11
3	$2 \times 3 - 1 = 5$	11
4	$2 \times 4 - 1 = 7$	11
5	$2 \times 5 - 1 = 9$	11
6	$2 \times 6 - 1 = 11$	11

Thus, we see that for $x = 6$, LHS = RHS

Hence, $x = 6$ is the solution of given equation. **Ans.**

(d) $20 - x = 12$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

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x	Value of LHS	Given the value of RHS
0	$20 - 0 = 20$	12
1	$20 - 1 = 19$	12
2	$20 - 2 = 18$	12
3	$20 - 3 = 17$	12
4	$20 - 4 = 16$	12
5	$20 - 5 = 15$	12
6	$20 - 6 = 14$	12
7	$20 - 7 = 13$	12
8	$20 - 8 = 12$	12

Thus, we see that for $x = 8$, LHS = RHS

Hence, $x = 8$ is the solution of given equation.   **Ans.**

(e) $6x + 2 = 16x - 8$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Value of LHS	Given the value of RHS
0	$6 \times 0 + 2 = 2$	$16 \times 0 - 8 = -8$
1	$6 \times 1 + 2 = 8$	$16 \times 1 - 8 = 8$

Thus, we see that for $x = 1$, LHS = RHS

Hence, $x = 1$ is the solution of given equation.   **Ans.**

(f) $\dfrac{1}{2} y + 4 = 6$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Value of LHS	Given the value of RHS
0	$1/2 \times 0 + 4 = 4$	6
1	$1/2 \times 1 + 4 = \dfrac{9}{2}$	6
2	$1/2 \times 2 + 4 = 5$	6
3	$1/2 \times 3 + 4 = 11$	6
4	$1/2 \times 4 + 4 = 6$	6

Thus, we see that for $x = 4$, LHS = RHS

Hence, $x = 4$ is the solution of given equation. **Ans.**

(g) $2x - 5 = 7 - x$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Value of LHS	Given the value of RHS
0	$2 \times 0 - 5 = -5$	$7 - 0 = 7$
1	$2 \times 1 - 5 = -3$	$7 - 1 = 6$
2	$2 \times 2 - 5 = -1$	$7 - 2 = 5$
3	$2 \times 3 - 5 = 1$	$7 - 3 = 4$
4	$2 \times 4 - 5 = 3$	$7 - 4 = 3$

Thus, we see that for $x = 4$, LHS $=$ RHS

Hence, $x = 4$ is the solution of given equation. **Ans.**

(h) $\dfrac{2x}{3} = 4$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Value of LHS	Given the value of RHS
0	$\dfrac{2 \times 0}{3} = 0$	4
1	$\dfrac{2 \times 1}{3} = \dfrac{2}{3}$	4
2	$\dfrac{2 \times 2}{3} = \dfrac{4}{3}$	4
3	$\dfrac{2 \times 3}{3} = 2$	4
4	$\dfrac{2 \times 4}{3} = \dfrac{8}{3}$	4
5	$\dfrac{2 \times 5}{3} = \dfrac{10}{3}$	4
6	$\dfrac{2 \times 6}{3} = 4$	4

Thus, we see that for $x = 6$, LHS $=$ RHS

Hence, $x = 6$ is the solution of given solution

(i) $19x = 38$

To find the value of the LHS and RHS, we try several values of x. We continue this process till then the value of LHS and RHS will be equal to the values of x.

x	Value of LHS	Given the value of RHS
0	$19 \times 0 = 0$	38
1	$19 \times 1 = 19$	38
2	$19 \times 2 = 38$	38

Thus, we see that for $x = 2$, LHS = RHS

Hence, $x = 2$ is the solution of given solution.

2. (a) 30 added to a variable x obtain $150 \Rightarrow x + 30 = 150$ **Ans.**

(b) Subtract 26 from variable y obtain $80 \Rightarrow y - 26 = 80$ **Ans.**

(c) Divided the variable x by 18 obtain $4 \Rightarrow \dfrac{x}{18} = 4$ **Ans.**

(d) 8 times a variable y equal $26 \Rightarrow 8y = 26$ **Ans.**

3. $\dfrac{2x}{4} + 2 = 5$ is $x = 6$

We take, LHS $= \dfrac{2x}{4} + 2$ $\qquad [\because x = 6]$

$$= \dfrac{2 \times 6}{4} + 2 = \dfrac{12}{4} + 2 = \dfrac{12 + 8}{4} = \dfrac{20}{4} = 5 = \text{LHS}$$

Thus, LHS = RHS **Proved.**

4. $6 + 4x = 14$ is $x = 2$

We take, LHS

$\qquad = 6 + 4x \ [\because x = 2] = 6 + 4 \times 2 = 6 + 8 = 14 = \text{RHS}$

Thus, LHS = RHS **Not proved.**

5. $8x - 6 = 18$ is $x = 3$

We take, LHS

$\qquad = 8x - 6 = 8 \times 3 - 6 \qquad [\because x = 3]$

$\qquad = 24 - 6 = 18 = \text{RHS}$

Thus, LHS = RHS **Proved.**

Exercise 8.5

1. (a) $23x - 14 = x + 8$

$\qquad 23x - x = 14 + 8$

or $\quad\quad\quad\quad\quad 22x = 22$ or $x = \dfrac{22}{22} = 1$

Thus, $x = 1$ is the solution of equation. **Ans.**

Verification: For $x = 1$

$\quad$ LHS $= 23x - 14 = 23 \times 1 - 14 = 23 - 14 = 9$

$\quad\quad\quad\quad\quad$ RHS $= x + 8 = 1 + 8 = 9$

$\therefore\quad\quad\quad\quad$ LHS $=$ RHS

$\quad$ Hence, $x = 1$ is the solution of equation. **Ans.**

(b) $29x - 43 = 21x + 13$

$\quad$ or $29x - 21x = 43 + 13$ or $8x = 56$ or $x = \dfrac{56}{8} = 7$

$\quad$ Thus, $x = 7$ is the solution of equation. **Ans.**

$\quad$ **Verification:** For $x = 7$

$\quad$ LHS $= 29x - 43 = 29 \times 7 - 43 = 203 - 43 = 160$

$\quad$ RHS $= 21x + 13 = 21 \times 7 + 13 = 147 + 13 = 160$

$\quad \therefore$ LHS $=$ RHS

$\quad$ Hence, $x = 7$ is the solution of equation. **Ans.**

(c) $x + 6 = 25 + \dfrac{x}{20}$

$\quad$ or $x - \dfrac{x}{20} = 25 - 6$ or $\dfrac{20x - x}{20} = 19$ or $\dfrac{19x}{20} = 19$ or $x = 20$

$\quad$ Thus, $x = 20$ is the solution of equation. **Ans.]**

$\quad$ **Verification:** For $x = 20$

$\quad$ LHS $= x + 6 = 20 + 6 = 26$

$\quad$ RHS $= 25 + \dfrac{20}{20} = 25 + 1 = 26$

$\quad \because$ LHS $=$ RHS

$\quad$ Hence, $x = 26$ is the solution of given equation.

(d) $4(x - 1) = 6x - 8$

$\quad$ or $4x - 4 = 6x - 8$ or $4x - 6x = -8 + 4$ or $-2x = -4$ or $x = 2$

$\quad$ Thus, $x = 2$ is the solution of equation. **Ans.**

$\quad$ **Verification:** For $x = 2$

$\quad$ LHS $= 4(x - 1) = 4(2 - 1) = 4 \times 1 = 4$

$\quad$ RHS $= 6x - 8 = 6 \times 2 - 8 = 12 - 8 = 4$

$\quad \therefore \quad\quad\quad\quad\quad$ LHS $=$ RHS

$\quad$ Hence, $x = 2$ is the solution of given equation. **Ans.**

(e) $15x - 5 = 4x + 6$

or $\quad 15x - 4x = 6 + 5$ or $11x = 11$ or $x = 1$

Thus, $x = 1$ is the solution of equation. **Ans.**

Verification: For $x = 1$

LHS $= 15x - 5 = 15 \times 1 - 5 = 15 - 5 = 10$

RHS $= 4x + 6 = 4 \times 1 + 6 = 4 + 6 = 10$

$\therefore$ LHS $=$ RHS

Hence, $x = 1$ is the solution of given equation. **Ans.**

(f) $21 + 25x = 45 + 13x$

or $25x - 13x = 45 - 21$ or $12x = 24$ or $x = \dfrac{24}{12} = 2$

Thus, $x = 2$ is the solution of equation. **Ans.**

Verification: For $x = 2$

LHS $= 21 + 25x = 21 + 25 \times 2 = 21 + 50 = 71$

RHS $= 45 + 13x = 45 + 13 \times 2 = 45 + 26 = 71$

$\therefore \qquad$ LHS $=$ RHS

Hence, $x = 2$ is the solution of given equation. **Ans.**

(g) $\dfrac{17x - 3}{4} = 29$

or $\dfrac{17x - 3}{4} \times 4 = 29 \times 4$ or $17x = 116 + 3$ or $x = \dfrac{119}{17} = 7$

Thus, $x = 7$ is the solution of equation. **Ans.**

Verification: For $x = 7$

LHS $= \dfrac{17x - 3}{4} = \dfrac{17 \times 7 - 3}{4} = \dfrac{119 - 3}{4} = \dfrac{116}{4} = 29$

RHS $= 29$

$\therefore$ LHS $=$ RHS

Hence, $x = 7$ is the solution of given equation. **Ans.**

(h) $\dfrac{y}{6} - \dfrac{1}{3} = \dfrac{y}{3} + 4$ or $\dfrac{y}{6} - \dfrac{y}{3} = 4 + \dfrac{1}{3}$

Multiply both sides by 6

or $y - 2y = 24 + 2$ or $-y = 26$ or $y = -26$

Thus, $y = -26$ is the solution of equation. **Ans.**

Verification :

LHS $= \dfrac{y}{6} - \dfrac{1}{3} = \dfrac{-26}{6} - \dfrac{1}{3} = \dfrac{-26 - 2}{6} = \dfrac{-28}{6} = \dfrac{-14}{3}$

$$\text{RHS} = \frac{y}{3} + 4 = \frac{-26}{3} + 4 = \frac{-26 + 12}{3} = \frac{-14}{3}$$

Hence, $x = -26$ is the solution of given equation. **Ans.**

(i) $3x + 46 = 8x + 16$

or $3x - 8x = 16 - 46$ or $-5x = -30$ or $\frac{-5x}{5} = \frac{-30}{5}$

$\therefore \qquad x = 6$

Thus, $x = 6$ is the solution of equation. **Ans.**

Verification: For $x = 6$

$\text{LHS} = 3x + 46 = 3 \times 6 + 46 = 18 + 46 = 64$

$\text{RHS} = 8x + 16 = 8 \times 6 + 16 = 48 + 16 = 64$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 6$ is the solution of given equation. **Ans.**

2. (a) $25x = 625$

$x = \frac{625}{25};\ x = 25$

Thus, $x = 25$ is the solution of given equation. **Ans.**

Verification: For $x = 25$

$\text{LHS} = 25x = 25 \times 25 = 625$

$\because \qquad\qquad \text{RHS} = 625$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 25$ is the solution of given equation. **Ans.**

(b) $4x - 3 = 21$

$4x = 21 + 3$

$4x = 24$

$x = \frac{24}{4} = 6$

Thus, $x = 6$ is the solution of given equation. **Ans.**

Verification: For $x = 6$

$\text{LHS} = 4x - 3 = 4 \times 6 - 3 = 24 - 3 = 21$

$\because \text{RHS} = 21$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 6$ is the solution of given equation. **Ans.**

(c) $12x = x + 99$

$12x - x = 99$

$11x = 99$

$x = 9$

Thus, $x = 9$ is the solution of given equation. **Ans.**

Verification: For $x = 9$

LHS $= 12x = 12 \times 9 = 108$

RHS $= x + 99 = 9 + 99 = 108$

$\therefore$ LHS $=$ RHS

Hence, $x = 9$ is the solution of given equation. **Ans.**

(d) $16x - 6 = 42$

Adding 6 to both sides of the equation,

We get, $16x - 6 + 6 = 42 + 6$

$\qquad 16x - 6 + 6 = 42 + 6$

$\qquad\qquad 16x = 48$

$\qquad\qquad\quad x = 3$

Thus, $x = 3$ is the solution of the equation. **Ans.**

Verification: For $x = 3$

$\qquad\qquad$ LHS $= 16x - 6 = 16 \times 3 - 6 = 48 - 6 = 42$

$\qquad\qquad$ RHS $= 42$

$\therefore \qquad\qquad$ LHS $=$ RHS

Hence, $x = 3$ is the solution of given equation. **Ans.**

(e) $x - 8 = 28$

Adding 8 to both sides of the equation,

We get, $x - 8 + 8 = 28 + 8$ or $x = 36$

Thus, $x = 36$ is the solution of the equation. **Ans.**

Verification: For $x = 36$

$\qquad\qquad$ LHS $= x - 8 = 36 - 8 = 28$

$\because \qquad\qquad$ RHS $= 28$

$\therefore \qquad\qquad$ LHS $=$ RHS

Hence, $x = 36$ is the solution of given equation. **Ans.**

(f) $2x + 67 = 413$

Subtracting 67 to both sides of the equation,

We get, $2x + 67 - 67 = 413 - 67$ or $2x = 346$ or $x = 173$

Thus, $x = 173$ is the solution of the equation. **Ans.**

Verification: For $x = 173$

$\qquad\qquad$ LHS $= 2x + 67 = 2 \times 173 + 67 = 413$

$\because \qquad\qquad$ RHS $= 413$

$\therefore \qquad\qquad$ LHS $=$ RHS

Hence, $x = 173$ is the solution of given equation. **Ans.**

(g) $\dfrac{x}{13} = 14$

Multiplying 13 to both sides of the equation.

We get, $\dfrac{x}{13} \times 13 = 14 \times 13$ or $x = 182$

Thus, $x = 182$ is the solution of the equation.   **Ans.**

Verification: For $x = 182$

$$\text{LHS} = \dfrac{x}{13} = \dfrac{182}{13} = 14$$

$\because$ $\text{RHS} = 14$

$\therefore$ $\text{LHS} = \text{RHS}$

Hence, $x = 182$ is the solution of given equation.   **Ans.**

(h) $3x + \dfrac{1}{2} = 8$

Subtracting $\dfrac{1}{2}$ to both sides of the equation

We get, $3x + \dfrac{1}{2} - \dfrac{1}{2} = 8 - \dfrac{1}{2}$

or $3x = \dfrac{16-1}{2}$ or $3x = \dfrac{15}{2}$ or $x = \dfrac{15}{2 \times 3}$

$\therefore$ $x = \dfrac{5}{2}$ or $2\dfrac{1}{2}$

Thus, $x = 2\dfrac{1}{2}$ is the solution of the equation.

                                                                    Ans.

Verification: $x = 2\dfrac{1}{2}$ or $\dfrac{5}{2}$

$\text{LHS} = 3x + \dfrac{1}{2} = 3 \times \dfrac{5}{2} + \dfrac{1}{2} = \dfrac{15}{2} + \dfrac{1}{2} = \dfrac{16}{2} = 8$

$\because \text{RHS} = 8$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 2\dfrac{1}{2}$ is the solution of given equation.

                                                                    Ans.

(i) $\dfrac{x}{7} - 2 = 15$

Adding 2 to both sides of the equation,

We get, $\dfrac{x}{7} - 2 + 2 = 15 + 2$

$$\frac{x}{7} = 17$$

$x = 17 \times 7$ or $x = 119$

Thus, $x = 119$ is the solution of the given equation. **Ans.**

Verification: For $x = 119$

$$\text{LHS} = \frac{x}{7} - 2 = \frac{119}{7} - 2 = \frac{119 - 14}{7} = \frac{105}{7} = 15$$

$\because \text{RHS} = 15$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 119$ is the solution of given equation. **Ans.**

(j) $4x - 8 = 8 - (6 - 3x)$

Adding 8 to both sides of the equation,

We get, $4x - 8 + 8 = 8 - (6 - 3x) + 8$

$$4x = 16 - (6 - 3x)$$
$$4x = 16 - 6 + 3x$$
$$4x - 3x = 10$$
$$x = 10$$

Thus, $x = 10$ is the solution of the equation. **Ans.**

Verification: For $x = 10$

$$\text{LHS} = 4x - 8 = 4 \times 10 - 8 = 40 - 8 = 32$$

$$\text{RHS} = 8 - (6 - 3x) = 8 - (6 - 3 \times 10) = 8 - 6 + 30 = 2 + 30 = 32$$

$\therefore \quad\quad\quad\quad \text{LHS} = \text{RHS}$

Hence, $x = 10$ is the solution of the given equation. **Ans.**

(k) $28x + 9 = 9x + 47$

Subtracting 9 to both the sides of the equation

We get,

$$28x + 9 - 9 = 9x + 47 - 9$$
$$28x = 9x + 38$$
$$28x - 9x = 38$$
$$19x = 38$$
$$x = 2$$

Thus, $x = 2$ is the solution of the equation. **Ans.**

Verification: For $x = 2$

$$\text{LHS} = 28x + 9 = 28 \times 2 + 9 = 56 + 9 = 65$$

$$\text{RHS} = 9x + 47 = 9 \times 2 + 47 = 18 + 47 = 65$$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 2$ is the solution of given equation. **Ans.**

3. (a) $20 - 3(x - 2) = 27 - 6x + 2(2x - 1)$

or $20 - 3x + 6 = 27 - 6x + 4x - 2$ or $-3x + 6x - 4x = 27 - 2 - 20 - 6$

$$-x = -1$$
$$x = 1$$

Hence, $x = 1$ is the solution of given equation.   **Ans.**

(b) $5x - 3(x - 2) = 3x - 2(x - 1)$

or $5x - 3x + 6 = 3x - 2x + 2$ or $5x - 3x - 3x + 2x = 2 - 6$

$$1x = -4$$
$$x = -4$$

Hence, $x = -4$ is the solution of given equation.   **Ans.**

(c) $2(x - 2) - 3(x - 3) = 5(x - 5)$

or $2x - 4 - 3x + 9 = 5x - 25$ or $2x - 3x - 5x = -25 + 4 - 9$

$$-6x = -30$$
$$x = \frac{-30}{-6}$$
$$x = 5$$

Hence, $x = 5$ is the solution of given equation.   **Ans.**

(d) $5(3x + 4) - 8(6x - 7) = 9x - 8$

or $15x + 20 - 48x + 56 = 9x - 8$

or $15x - 48x - 9x = -8 - 20 - 56$

or $-42x = -84$

$$x = \frac{-84}{-42}$$
$$x = 2$$

Hence, $x = 2$ is the solution of given equation.   **Ans.**

Multiple Choice Questions

1. (i) c,   (ii) d,   (iii) d,   (iv) c,   (v) a

9. Basic Geometrical Concepts

Exercise 9.1

1. (a) A   (b) No
    (c) Two lines   (d) Point of concurrence

2. (a) The marked points are A, B, C, D, E, F, G, H.   **Ans.**

    (b) The line segments are AB, CG, DE, FH, CD, BH, GE, AF, DH, BC, AG, EF   **Ans.**

    (c) The planes are AGEF, BCDH, CDEG, ABHF, ABCG, EFHD.   **Ans.**

3. (a) F,   (b) T,   (c) F,   (d) F,   (e) T,   (f) T,

(g) F,   (h) T,   (i) T.   **Ans.**
4. Concurrent line = n, p, q, r, l, n
    Concurrent Point = A, B, C
5. (a) The lines l, m, n are which intersect at point A.   **Ans.**
    (b) The lines m, q, r are which intersect at point B.   **Ans.**
    (c) The lines p, q, l are which intersect at point C.   **Ans.**
    (d) The lines, l, r are which intersect at point D.   **Ans.**
    (e) Concurrent lines are l, m, n and concurrent points is A. **Ans.**
    Concurrent lines are m, r, q and concurrent points is B.   **Ans.**
    Concurrent lines are l, p, q and concurrent point is C.   **Ans.**

Exercise 9.2
1. (a) Closed,   (b) Four, Four   (c) Three, three
    (d) quadrlateral   (e) triangle
2. (a) closed,   (b) open,   (c) simple closed,   (d) open,
    (e) simple closed,   (f) open.
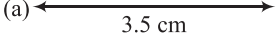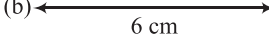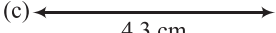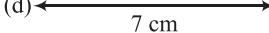
3.   open curve =   )   and
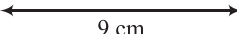
     closed curve = ◯ and ∞

4. a, c, e are polygons.

Exercise 9.3

1.   (a) ←―――――→   (b) ←―――――――→
             3.5 cm   6 cm
        (c) ←―――――→   (d) ←―――――――→
             4.3 cm   7 cm
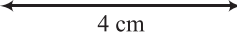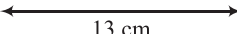
2. (a) AB + CD = 6.5 cm + 2.5 cm = 9 cm
                    ←――――――→
                        9 cm

    (b) AB − CD = 6.5 cm − 2.5 cm = 4 cm
                    ←――――――→
                        4 cm

    (c) 2AB = 2 × 6.5 cm = 13 cm
                    ←――――――→
                        13 cm

    (d) 3CD = 3 × 2.5 cm = 7.5 cm

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7.5 cm

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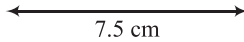
3.   Length of line segment $AB = 8$ cm
Length of other segments $CD = 5$ cm
So, difference of these segment $= AB - CD = 8$ cm $- 5$ cm $= 3$ cm

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3 cm

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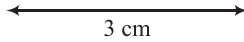
Hence, the line segment, whose length is the difference of the lengths of these segment $= 3$ cm.

4.   Length of line segment $= 12$ cm
Cut of segment $= 6.8$ cm
So, the remaining $= 12$ cm $- 6.8$ cm $= 5.2$ cm

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5.2 cm

</div>
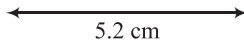
5. Length of line segment $AB = 3.5$ cm
The line segment of CD is double by AB.
So, the line segment $CD = 2 \times 3.5$ cm $= 7$ cm

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7 cm

</div>
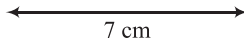
6. In first figures,
The line segment $= AB + AC = 2.5$ cm $+ 2.5$ cm $= 5$

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5 cm

</div>
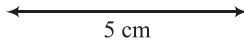
In second figures,
The line segment $= AB + AC = 2$ cm $+ 3.5$ cm $= 5.5$ cm

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5.5 cm

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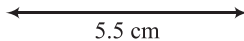
7. Do yourself.
8. Do yourself.

Exercise 9.4

1. (a) Vertices $= S$ arms $= ST, SR$
(b) Vertices $= Q$ arms $= PQ, QR$
(c) Vertices $= O$ arms $= CO, DO$
(d) Vertices $= R$ arms $= RS, TR$
(e) Vertices $= R$ arms $= PR, QR$
(f) Vertices $= O$ arms $= AO, OB$
2. (a) 4 rays   (b) 6 rays
3. (a) On $\angle AOB = A, D, O, C, B$

(b) In the interior of $\angle AOB = E, F$

(c) In the exterior of $\angle AOB = $ G, H

4. (a) PR (b) Q (c) $\angle PRQ$ or $\angle QRP$, $\angle PRS$ or $\angle SRP$

(d) $\angle SPR$ or $\angle RPS$, $\angle RPQ$ or $\angle QPR$ (e) R

(f) $\angle PQR$ or $\angle RQP$, $\angle PSR$ or $\angle RSP$

5. (a) $\angle P$, $\angle Q$, $\angle R$ (b) $\angle P$, $\angle Q$, $\angle R$, $\angle S$

(c) $\angle P$, $\angle Q$, $\angle R$, $\angle S$, $\angle SPR$, $\angle RPQ$, $\angle SRP$, $\angle QRP$

(d) $\angle PQT$, $\angle PQS$, $\angle PQR$, $\angle TQS$, $\angle TQR$, $\angle SQR$

Exercise 9.5

1. Suraj is going to North direction. When he takes right angle to left and them he turns right angle to left, the direction will be South. **Ans.**

2. First ship is going to East and the second ship is going to South, the angle between them is 90°. IT is a right angle. **Ans.**

3. (a) In 2 right angles

∵ Right angle has 90°.

So, The 2 right angles $= 2 \times 90° = 180°$ **Ans.**

(b) In 3 right angles

∵ Right angle has 90°.

So, the 3 right angles $= 3 \times 90° = 270°$ **Ans.**

(c) In $\dfrac{2}{3}$ right angles

∵ Right angle has 90°

So, the $\dfrac{2}{3}$ right angles $= \dfrac{2}{3} \times 90° = 60°$ **Ans.**

(d) In $\dfrac{1}{3}$ straight angle

∵ Straight angle has 180°.

So, the $\dfrac{1}{3}$ straight triangle $= \dfrac{1}{3} \times 180° = 60°$ **Ans.**

4. (a) When it is 3 o'clock

The degree between the hours and minutes hand of the clock is 90° because the angle is right angle. **Ans.**

(b) When it is 6 o'clock

The degree between the hours and minutes hand of the clock is 180° because the angle is straight angle. **Ans.**

(c) When it is 12 o'clock

The degree between the hours and minutes hand of the clock is 360° or because the angle is complete angle or zero angle. **Ans.**

5. (a) Complete angle, it has 360° angle. **Ans.**

(b) Obtuse angle, it is has more than 90° and less than 180° angle. **Ans.**

(c) Acute angle, it has less than 90° angle. **Ans.**

(d) Right angle, it has 90° angle. **Ans.**

(e) Reflex angle, it has more than 180° and less than 360° angle. **Ans.**

(f) Zero angle, it has 0° angle. **Ans.**

6. (a) It is 50° angle. **Ans.** (b) It is 40° angle. **Ans.**

(c) It is 120° angle. **Ans.** (d) It is 50° angle. **Ans.**

(e) It is 90° angle. **Ans.** (f) It is 120° angle. **Ans.**

7. (a) $\angle 1 = 50°$, $\angle 2 = 110°$

Hence, $\angle 2$ is largest angle. **Ans.**

(b) $\angle 1 = 110°$, $\angle 2 = 220°$

Hence, $\angle 2$ is largest angle. **Ans.**

(c) $\angle 1 = 190°$, $\angle 2 = 50°$

Hence, $\angle 1$ is largest angle. **Ans.**

(d) $\angle 1 = 40°$, $\angle 2 = 110°$

Hence, $\angle 2$ is largest angle. **Ans.**

Exercise 9.6

1. (a) T,   (b) T,   (c) F,   (d) T,   (e) T,   (f) T,

2. (a) Yes,   (b) Yes,   (c) Yes,   (d) Yes,   (e) No

3. We know that the angle of linear pair is supplementary angle.

(a) $\because\ x° + 70° = 180°$

or $x° = 180° - 70° = 110°$

$\therefore$ $x° = 110°$ **Ans.**

(b) $\because 40° + x° + 70° = 180°$

$x = 180° - 70° - 40° = 70°$ **Ans.**

(c) $\because 4x° + 5x° = 180°$ or $9x° = 180°$ or $x° = \dfrac{180°}{9}$

$\therefore$ $x° = 20°$ **Ans.**

(d) We know that the angle of right angle.

$\because$ $x° + 30° = 90°$

$x° = 90° - 30°$

$\therefore$ $x° = 60°$ **Ans.**

Progress With Maths-6

(e) $\because$ The opposite angles are equal to each other,

So, the $x° = 70°$

(f) We know that the straight angle has 180° and there are 2 lines intersect each other.

$\because$ $\qquad 65° + x° = 180°$

$\qquad\qquad\qquad x° = 180° - 65°$

$\therefore$ $\qquad\qquad x° = 115°$ **Ans.**

4. (a) 25°, 65°

$\qquad 25° + 65° = 90°$

Complementary angle, because the sum of both angles $= 90°$

Ans.

(b) 50°, 130°

$\qquad 50° + 130° = 180°$

Supplementary angle, because the sum of both angles,

$\qquad\qquad = 180°$ **Ans.**

(c) 36°, 54°

$\qquad 36° + 54° = 90°$

Complementary angle, because the sum of both angles $= 90°$

Ans.

(d) 90°, 90°

$\qquad 90° + 90° = 180°$

Supplementary angle, because the sum of both angles $= 180°$

Ans.

(e) 32°, 148°

$\qquad 32° + 148° = 180°$

Supplementary angle, because the sum of both angles $= 180°$

Ans.

(f) 69°, 21°

$\qquad 69° + 21° = 90°$

Complementary angle, because the sum of both angles $= 90°$

Ans.

5. We know that the sum of supplementary angles is equal to two right angles (180°), Thus,

(a) Supplementary angle of $70° = 180° - 70° = 110°$ **Ans.**

(b) Supplementary angle of $60° = 180° - 60° = 120°$ **Ans.**

(c) Supplementary angle of $110° = 180° - 110° = 70°$ **Ans.**

(d) Supplementary angle of $75° = 180° - 75° = 105°$ **Ans.**

(e) Supplementary angle of $35° = 180° - 35° = 145°$ **Ans.**

(f) Supplementary angle of $90° = 180° - 90° = 90°$ **Ans.**

6. We know that the sum of complementary angle is right angle (90°). Thus,

(a) Complementary angle of $60° = 90° - 60° = 30°$ **Ans.**

(b) Complementary angle of $55° = 90° - 55° = 35°$ **Ans.**

(c) Complementary angle of $75° = 90° - 75° = 15°$ **Ans.**

(d) Complementary angle of $40° = 90° - 40° = 50°$ **Ans.**

(e) Complementary angle of $45° = 90° - 45° = 45°$ **Ans.**

(f) Complementary angle of $80° = 90° - 80° = 10°$ **Ans.**

7. (a) $\angle ABF$, $\angle ABC$; $\angle BCE$, $\angle DCE$; $\angle EAF$, $\angle BAC$ **Ans.**

(b) $\angle DAC$, $\angle CAB$; $\angle DCA$, $\angle ACB$ **Ans.**

8. (a) Linear pair are $\angle 1, \angle 2$; $\angle 2, \angle 3$; $\angle 3, \angle 4$; $\angle 4, \angle 1$; $\angle 5, \angle 6$; $\angle 6, \angle 7$; $\angle 7, \angle 8$; $\angle 8, \angle 5$.
Vertically opposite angle are $\angle 1, \angle 3$; $\angle 2, \angle 4$; $\angle 6, \angle 8$; $\angle 5, \angle 7$. **Ans.**

(b) Linear pair are $\angle 1, \angle 2$; $\angle 2, \angle 3$; $\angle 3, \angle 4$; $\angle 4$; $\angle 4$; $\angle 1$; $\angle 5, \angle 6$; $\angle 6, \angle 7$; $\angle 7, \angle 8$; $\angle 8, \angle 5$; $\angle 9, \angle 10$; $\angle 10, \angle 11$; $\angle 11, \angle 12$; $\angle 12, \angle 9$.
Vertically opposite angles are
$\angle 1, \angle 3$; $\angle 2, \angle 4$; $\angle 6, \angle 8$; $\angle 5, \angle 7$; $\angle 9, \angle 11$; $\angle 10, \angle 12$. **Ans.**

9. An angle is equal to its complement.
Complement angle $= 90°$
So, magnitude $= \dfrac{90°}{2} = 45°$ **Ans.**

10. An angle is equal to its supplement.
Supplement angle $= 180°$
So, magnitude $= \dfrac{180°}{2} = 90°$ **Ans.**

Multiple Choice Questions

1. (i) c, (ii) a, (iii) b, (iv) c, (v) c.

10. Understanding Elementary Shapes

1. $\because$ $\angle B = 55°$ (given)

              $\angle B = \angle y$ (alternate angles)

    $\because$ $BC \parallel RS$

    $\therefore$ $\angle y = 55°$

    $\because$ $\angle c = 45°$ (given)

    and $\angle c = \angle x$ (alternate angles)

              $\angle x = 45°$

    Thus, $\angle x = 45°$ and $\angle y = 55°$ **Ans.**

2. $\because$ $\angle x = 70°$

    Because the angles are corresponding angle and these are equal.

    Thus, $\angle x = 70°$ **Ans.**

3. $\because$ $\angle B = 75°$ (given)

             $\angle B = \angle S$ (corresponding angle are equal)

    $\therefore$ $\angle S = 75°$

    Thus, $\angle S = 75°$ **Ans.**

4. $\because$ $\angle a = 60°$ (because the opposite angles are equal)

            $\angle b = \angle a$ ($\therefore$ corresponding angles are equal)

    $\because$ $\angle b = 60°$

    $\because$ $\angle c = \angle a$ ($\because r \parallel S$)

            $\angle c = 60°$

    $\because$ $\angle d = \angle b$ ($\because r \parallel S$)

             $\angle d = 60°$

    Thus, $\angle a = 60°$, $\angle b = 60°$, $\angle c = 60°$, and $\angle d = 60°$ **Ans.**

5. $3x + 2° = x + 30°$ ($\because$ Alternate angles are equal)

          $3x - x = 30° - 2°$

             $2x = 28°$

              $x = 14°$

    Thus, $\angle x = 14°$ **Ans.**

6. $\angle 2 = 80°$ (given)

    $\because$ $\angle 4 = \angle 2$ (vertically opposite angles)

    $\therefore$ $\angle 4 = 80°$

    $\because$ $\angle 4 = \angle 6$ (alternate angles)

    $\therefore$ $\angle 6 = 80°$

    Now, $\angle 3 + \angle 6 = 180°$ (angles on the transversal line)

    $\therefore$ $\angle 3 = 180° - \angle 6$

$$\angle 3 = 180° - 80° = 100°$$

and $\angle 4 + \angle 5 = 180°$ (angles on transversal line)

∴ $\angle 5 = 180° - \angle 4$

$$\angle 5 = 180° - 80° = 100°$$

Now, $\angle 1 = \angle 5 = 100°$ (corresponding angles)

$\angle 4 = \angle 8 = 80°$ (corresponding angles)

$\angle 7 = \angle 3 = 100°$ (corresponding angles)

Thus, $\angle 1 = 100°$, $\angle 2 = 80°$, $\angle 3 = 100°$, $\angle 4 = 80°$, $\angle 5 = 100°$,

$\angle 6 = 80°$, $\angle 7 = 100°$, $\angle 8 = 80°$ **Ans.**

7. $\angle 1 = 50°$ (given)

∵ $\angle 1 = \angle 3$ (vertically opposite angles)

∴ $\angle 3 = 50°$

∵ $\angle 8 = 65°$ (given)

$$\angle 3 + \angle 8 = 65° + 50° = 115°$$

Since, we see that a pair of corresponding angle is not equal to 180°.

∴PQ is not parallel RS

Thus, both the lines PQ and RS are not parallel.   **Ans.**

8. ∵ $\angle 1 = 110°$

∴ $\angle 1 = \angle 3$ (vertically opposite angles)

∴ $\angle 3 = 110°$ and $\angle 5 = 70°$ (given)

∵ $\angle 3 + \angle 5 = 110° + 70° = 180°$

we see that a pair of corresponding angle is equal to 180°.

Thus, both the lines P and Q are parallel.   **Ans.**

9. A line is a plane which cuts two or more given lines in different points is called a transversal line.

(a) Thus, it is not a transversal line.   **Ans.**

(b) Thus, it is not a transversal line.   **Ans.**

(c) Thus, it is a transversal line.   **Ans.**

(d) Thus, it is not a transversal line.   **Ans.**

10. (a) $AB \| CD$, $AC \| BD$

(b) $AB \| DE$, $FA \| DC$, $EF \| BC$

(c) $PQ \| RS \| UT$, $QR \| PS$, $ST \| RU$

(d) $PQ \| BC$, $PR \| AC$, $QR \| AB$

11. $\angle 3 = 65°$ (given)

∵ $\angle 1 = \angle 3$ (vertically opposite angles)

∴ $\angle 1 = 65°$

∴ ∠3 = ∠5 (alternate angle)

∴ ∠5 = 65°

Now, ∠4 + ∠5 = 180° (Angles on transversal line)

∴ ∠4 = 180° − ∠5 = 180° − 65° = 115°

and ∠3 + ∠6 = 180° (Angles on transversal line)

∴ ∠6 = 180° − ∠3 = 180° − 65° = 115°

Now, ∠2 = ∠6 = 115° (corresponding angle)

∠7 = ∠3 = 65°

∠8 = ∠4 = 115°

Thus, ∠1 = 65°, ∠2 = 115°, ∠4 = 115°, ∠5 = 65°, ∠6 = 115°, ∠7 = 65°, ∠8 = 115°. **Ans.**

Exercise 10.2

1. (a) Eight triangles are formed,
   They are
   $\triangle AOB$, $\triangle BOC$, $\triangle COD$, $\triangle DOA$, $\triangle ABC$, $\triangle ACD$,
   $\triangle ABD$, $\triangle BCD$

(b) The triangles which P in their interior region are
   $\triangle COD$, $\triangle BCD$, $\triangle ACD$

(c) The triangles which P in their exterior region are
   $\triangle AOD$, $\triangle AOB$, $\triangle BOC$, $\triangle ABD$, $\triangle ABC$

(d) The triangles which Q in their interior region are
   $\triangle AOB$, $\triangle ABC$, $\triangle ABD$

(e) The triangles which Q in their exterior region are
   $\triangle AOD$, $\triangle OCD$, $\triangle BOC$, $\triangle BCD$, $\triangle ACD$

(f) The triangles which O in their interior region are
   $\triangle BOC$, $\triangle ABC$, $\triangle BCD$

(g) The triangles which O in their exterior region are
   $\triangle AOB$, $\triangle AOD$, $\triangle COD$, $\triangle ACD$, $\triangle ABD$

2. (a) Opposite side of vertex Q is PR.   **Ans.**
   (b) Opposite angle of side PQ is ∠R   **Ans.**
   (c) Opposite side of ∠P is QR.   **Ans.**
   (d) Opposite vertex of side QR is P.   **Ans.**

3. (a) Equilateral triangle, because its all sides are equal.   **Ans.**
   (b) Isosceles triangle, because its, 2 sides are equal.   **Ans.**
   (c) Scalene triangle, because its all sides are unequal.   **Ans.**
   (d) Scalene triangle, because its all sides are unequal.   **Ans.**
   (e) Equilateral triangle, because its all sides are equal.   **Ans.**
   (f) Scalene triangle, because its all sides are unequal.   **Ans.**

4. (a) Right angled triangle, because its one angle is a right angle.

Ans.

(b) Acute angled triangle, because its each angle is less than 90°.

Ans.

(c) Obtuse angled triangle, because its one angle is obtuse. **Ans.**

(d) Acute angled triangle, because its each angle is less than 90°.

Ans.

(e) Obtuse angled triangle, because its one angle is obtuse. **Ans.**

(f) Acute angled triangle, because its each angle is less than 90°.

Ans.

5. (a) $\therefore$ The sum of angles of a triangle is 180° and each angle have 60° angle.

So, in this figure there are two triangles,

Then, the sum of the angles of both triangles $= 180° + 180° = 360°$

Verification:

$\text{LHS} = \angle A + \angle B + \angle C + \angle D + \angle E + \angle F$

$= 60° + 60° + 60° + 60° + 60° + 60° = 360°$

$\because \text{RHS} = 360°$

$\therefore \text{LHS} = \text{RHS}$ **Proved.**

6. (a) 3 cm, 4 cm, 5 cm

This is a length of a triangle because all the lengths are right.
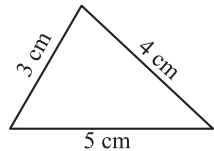
Ans.

(b) 10 cm, 1 cm, 12 cm
It is not a length of a triangle, because 2 lengths are right but 3rd is wrong.
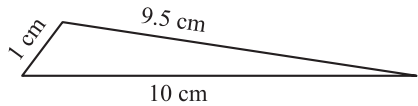
(c) 1.5 cm, 2.5 cm, 5 cm
It is not a length of a triangle-because 2 lengths are right but 3rd is wrong.
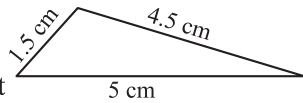
(d) 5 cm, 6 cm, 10 cm
It is not a length of a triangle because 2 lengths are right but 3rd is wrong.
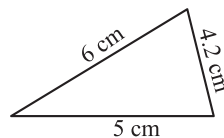
7. We know, that the sum of the angle of a triangle is $180°$.

So, $\angle P = 40°$ and $\angle Q = 60°$

Then, $\angle P + \angle Q + \angle PRQ = 180°$

$40° + 60° + \angle PRQ = 180°$

$\angle PRQ = 180° - 100°$

$\therefore$ $\angle PRQ = 80°$

Then, $\angle PRQ + \angle PRS = 180°$

$80° + \angle PRS = \angle 180°$(Linear pairs)

$\angle PRS = 180° - 180°$

$\angle PRS = 100°$

Thus, $\angle PRS = 100°$ **Ans.**

8. $\because$ Exterior angle $= 120°$

and interior angle $= 60°$

we know that the exterior angle of a triangle is equal to sum of the interior opposite angles.
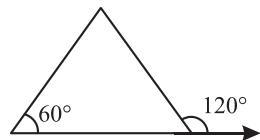
$\therefore$Other interior opposite angle $= 120° - 60° = 60°$

Thus, other interior opposite angle $= 60°$ **Ans.**

9. We know that the sum of angles of isoceless triangle is $180°$.

Both the angles have $= 80°$

So, the sum of angles $= 80° + 80°$

The third angle $= 180° - 160° = 20°$

Thus, third angle is $20°$ **Ans.**

10. Two angles of a triangle $70°$ and $40°$

We know, that the sum of angles of a triangle $= 180°$

So, $\angle 1 + \angle 2 + \angle 3 = 180°$

$70° + 40° + \angle 3 = 180°$

$\angle 3 = 180° - 110°$

$\angle 3 = 70°$

Thus, the third angle is $70°$ **Ans.**

Multiple Choice Questions

1. (i) b, (ii) c, (iii) c, (iv) c, (v) a, (vi) a, (vii) b.

11. Construction

Exercise 11.1

1. (a) 45°
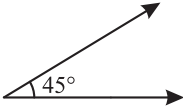
(b) 60°
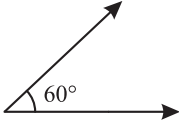
(c) 70°
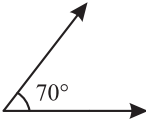
(d) 120°

(e) 110°

(f) 140°

(g) 210°

(h) 105°

2.

6 cm

P   Q

3.

P

A————B
    6 cm

4.

C

A————B
    4 cm

5.

M

P   4.5 cm   Q
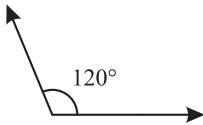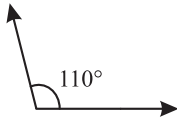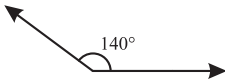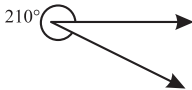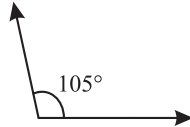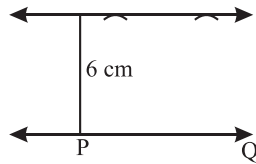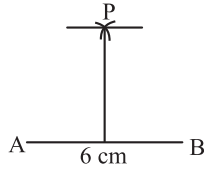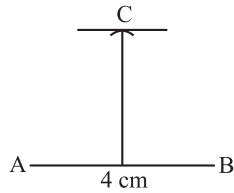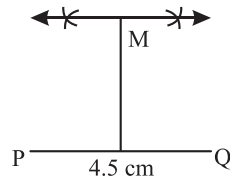
Exercise 11.2

1. (a) 60°
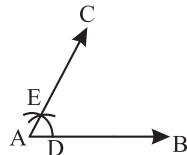
(b) 45°
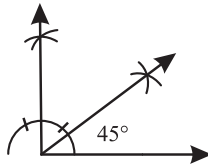
(c) 75°
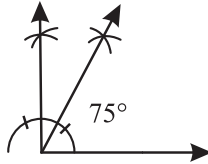
(d) 105°
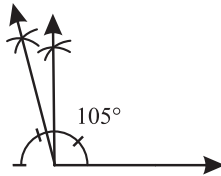
(e) 150°
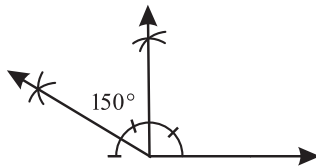
(f) 135°
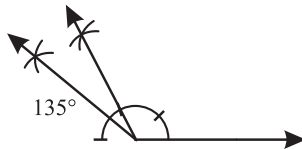
2.
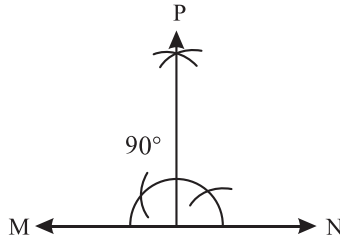
3.
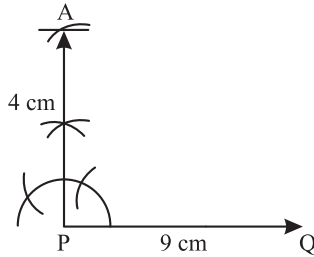
4.
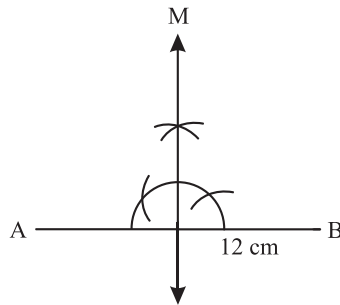
5. We use the following steps:
   (a) Draw a line QR
   (b) With Q as centre and any suitable radius, draw an arc cutting QR at point M.
   (c) With M as centre and same radius, drawn another arc which cuts first arc on point N.
   (d) Joining Q and N, draw a line QP.
   Thus, obtained $\angle PQR$ is 60°.
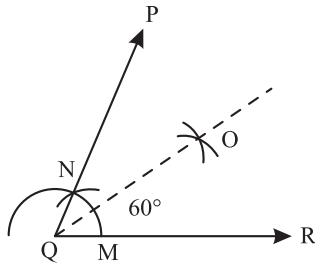
(e) Now, with the same radius and N as centre and same radius, drawn an other arc which cuts each other at point O.

(f) Joining point Q with O draw a ray QO.
   Thus, ray QO bisects the $\angle PQR$.

6. Draw bisector of line segment of 8cm.

(a) Draw a line segment $+AB$ of 8cm.

(b) Take A and B as centre draw A & C which interest at P and Q.

(c) Join PQ

(d) PQ intersect AB at M
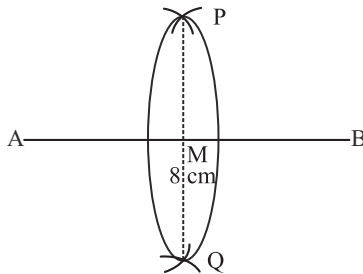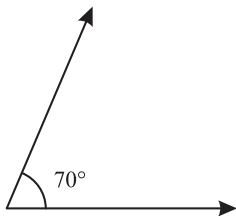
7. (a) 70°   (b) 110°
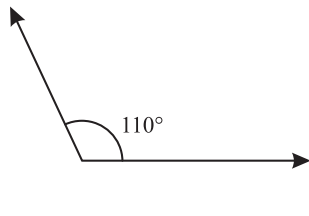
Exercise 11.3

1. (a) sector (b) arc   (c) chord (d) centre, circle   (e) meet

2. A line segment with its end points lying on a circle is a chord.
The longest chord is diameter.
$\therefore$ Longest chord $= 2 \times$ Radius $= 2 \times 9$ cm $= 18$ cm
Thus, longest chord is 18 cm.

18 cm

Ans.

3.

5 cm

P   Q

P

Q

2.5 cm

4.

5 cm

5.

8 cm

6 cm
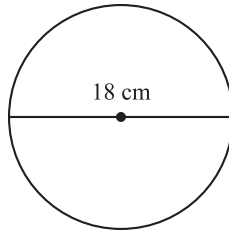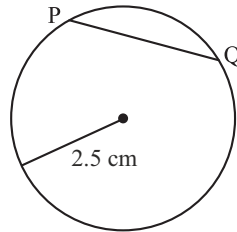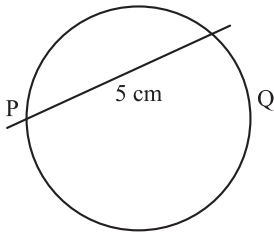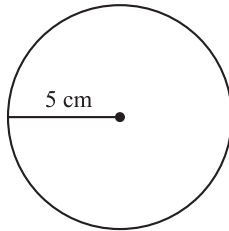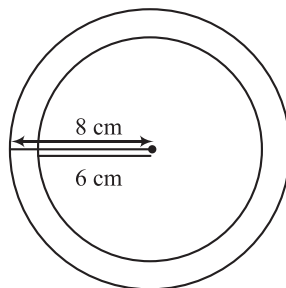
A line segment that passes through the centre of a circle and having its end points on the circle is called a diameter of a circle.

So, the diameter of 6 cm circle = 12 cm

the diameter of 8 cm circle = 16 cm **Ans.**

6.
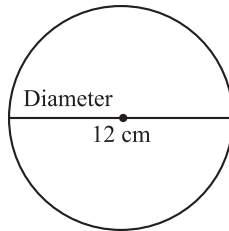
Diameter
12 cm

The diameter of a circle = 12 cm

and length of a circle = 12 cm. **Ans.**

12. Symmetry

Exercise 12.1

1. Do yourself.
2. (a) Four   (b) Two   (c) one   (d) Three (e) Two   (f) Four
   (g) Three (h) One   (i) Three (j) Infinite (k) Four
3. (a) Only one line of symmetry?
      Yes **Ans.**
   (b) Two lines of symmetry?
      No **Ans.**
   (c) Three lines of symmetry?
      Yes **Ans.**
   (d) No line of symmetry?
      Yes **Ans.**
4. (a) A, H, I, M, O, T, U, V, W X, are the alphabets have vertical lines of symmetry. **Ans.**
   (b) B, C, D, E, H, I, K, O, S, X Z are the alphabets have horizontal lines of symmetry. **Ans.**
   (c) F, G, J, N, P, Q, R, Y are the alphabets have no lines of symmetry. **Ans.**

5. Do yourself.

Exercise 12.2

1. (a) 6, 3, 2, 9   (b) 3, 1, 6   (c) 4, 8
    (d) sphere   (e) 6, 12, 8
2. (a) Cone $\rightarrow$ (v)   (b) Sphere $\rightarrow$ (iv)   (c) Cylinder $\rightarrow$ (i)
    (d) Cuboid $\rightarrow$ (ii)   (e) Pyramid $\rightarrow$ (iii)

Multiple Choice Questions

1. (i) d,   (ii) a,   (iii) a,   (iv) b.

13. Perimeter and Area

1. (a) $\therefore$ Perimeter of this shape = side + side + side + side + side
    $= 6\,cm + 6\,cm + 6\,cm + 6\,cm + 6\,cm = 30\,cm$
    Thus, the required perimeter is 30 cm.   **Ans.**
    (b) $\therefore$ Perimeter of this shape = side + side + side + side + side + side + side + side + side + side
    $= 6\,cm + 3\,cm + 3\,cm + 3\,cm + 3\,cm + 3\,cm + 3\,cm + 3\,cm + 3$
    cm$+3\,cm + 6\,cm = 42\,cm$
    Thus, the perimeter is 42 cm.   **Ans.**
    (c) $\therefore$ Perimeter of this shape = side + side + side + side + side + side + side
    $= 3.5\,cm + 3.5\,cm + 0.5\,cm + 0.5\,cm + 7\,cm + 7\,cm + 2\,cm = 24$
    cm
    Thus, the perimeter is 24 cm.   **Ans.**
    (d) $\therefore$ Perimeter of this shape = side + side + side + side + side + side + side + side + side + side + side + side + side + side + side
    $= 3\,cm + 1\,cm + 3\,cm + 1\,cm + 3\,cm + 1\,cm + 3\,cm + 1\,cm + 3\,cm$
    $+1\,cm + 3\,cm + 1\,cm + 3\,cm + 1\,cm + 1\,cm + 21\,cm = 50\,cm$
    Thus, the perimeter 50 cm.   **Ans.**
2. (a) $\because$ Perimeter of rectangle $= 80\,cm$
    Length of rectangle $= 24\,cm$
    $\therefore$ Perimeter of rectangle = length + breadth + length + breadth
    or 80 cm $= 24\,cm$ + breadth $+ 24\,cm$ + breadth
    or 80 cm $= 48\,cm + 2$ breadth
    or 80 cm $- 48\,cm = 2$ breadth
    32 cm $= 2$ breadth

breadth $= \dfrac{32\,\text{cm}}{2}$

breadth $= 16$ cm

Thus, breadth of rectangle $= 16$ cm **Ans.**

(b) ∵ Perimeter of rectangle $= 52.6$ cm

Length of rectangle $= 19$ cm

∴Perimeter of rectangle = length + breadth + length + breadth

52.6 cm $= 19$ cm + breadth + 19 cm + breadth

52.6 cm $= 38$ cm + 2 breadth

52.6 cm $- 38$ cm $= 2$ breadth

14.6 cm $= 2$ breadth

breadth $= \dfrac{14.6}{2}$ cm

breadth $= 7.3$ cm

Thus, breadth of rectangle is 7.3 cm. **Ans.**

(c) ∵ Perimeter of rectangle $= 2000$ m

length of rectangle $= 400$ m

∴Perimeter of rectangle = length + breadth + length + breadth

$= 400$ m + breadth + 400 m + breadth

$= 800$ m + 2 breadth

2000 m $- 800$ m $= 2$ breadth

1200 m $= 2$ breadth

breadth $= \dfrac{1200\,\text{m}}{2}$

breadth $= 600$ m

Thus, breadth of rectangle is 600 m. **Ans.**

(d) ∵ Perimeter of rectangle $= 2100$ m

Length of rectangle $= 700$ m

∴perimeter of rectangle = length + breadth + length + breadth

2100 m $= 700$ m + breadth + 700 m + breadth

2100 m $= 1400$ m + 2 breadths

2100 m $- 1400$ m $= 2$ breadth

700 m $= 2$ breadth

breadth $= \dfrac{700\,\text{m}}{2}$

breadth $= 350$ m

Thus, breadths of rectangle $= 350$ m **Ans.**

3. (a) ∵ length $= 28$ cm, breadth $= 22$ cm

∴Perimeter of rectangle $=$ breadth $+$ length $+$ breadth $+$ length

$= 28$ cm $+22$ cm $+28$ cm $+22$ cm $= 100$ cm

Thus, perimeter of rectangle is 100 cm. **Ans.**

(b) ∵ length $= 27$ m, breadth $= 13$ m

∴Perimeter of rectangle $=$ length $+$ breadth $+$ length $+$ breadth

$= 27$ m $+13$ m $+27$ m $+13$ m $= 80$ m.

Thus, Perimeter of rectangle is 80 m. **Ans.**

(c) ∵ length $= 45$ m, breadth $= 31$ m

∴Perimeter of rectangle $=$ length $+$ breadth $+$ length $+$ breadth

$= 45$ m $+31$ m $+45$ m $+31$ m $= 152$ m

Thus, perimeter of rectangle is 152 m. **Ans.**

(d) ∵ length $= 9.5$ cm, breadth $= 6.5$ cm

∴Perimeter of rectangle $=$ length $+$ breadth $+$ length $+$ breadth

$= 9.5$ cm $+6.5$ cm $+9.5$ cm $+6.5$ cm $= 32$ cm

Thus, perimeter of rectangle is 32 cm. **Ans.**

4. (a) ∵ Side of square $= 32$ cm

∴Perimeter of square $= 4 \times$ side $= 4 \times 32$ cm $= 128$ cm

Thus, perimeter of square is 128 cm. **Ans.**

(b) ∵ Side of square $= 9.5$ cm

∴Perimeter of square $= 4 \times$ side $= 4 \times 9.5$ cm $= 38$ cm

Thus, perimeter of square is 38 cm. **Ans.**

(c) ∵ Side of square $= 72$ m

∴perimeter of square $= 4 \times$ side $= 4 \times 72$ m $= 288$ m

Thus, perimeter of square is 288 m. **Ans.**

(d) ∵ Side of square $= 10.5$ cm

∴Perimeter of square $= 4 \times$ side $= 4 \times 10.5$ cm $= 42$ cm

Thus, perimeter of square is 42 cm. **Ans.**

5. (a) ∵ Perimeter of square $= 72$ m

∴ Perimeter $= 4 \times$ side

Put the both value are of square equal,

4 side $= 72$ m

$$\text{side} = \frac{72}{4} \text{ m} = 18 \text{ m}$$

Thus, length of square is 18 m. **Ans.**

(b) ∵ Perimeter of square $= 24$ cm

∴ Perimeter of square $= 4 \times$ side

Put the both values are equal,

$$4 \times \text{side} = 24 \text{ cm}$$
$$\text{Side} = \frac{24}{4} \text{ cm}$$
$$\text{Side} = 6 \text{ cm}$$

Thus, length of square is 6 cm. **Ans.**

(c) ∵ Perimeter of square $= 540$ m

∴ Perimeter of square $= 4 \times$ side

Put the both values are equal,

$$4 \times \text{side} = 540 \text{ m}$$
$$\text{Side} = \frac{540}{4} \text{ m}$$
$$\text{Side} = 135 \text{ m}$$

Thus, length of square is 135 m. **Ans.**

(d) ∵ Perimeter of square $= 28.8$ cm

∴   perimeter of square $= 4 \times$ side

Put the both values are equal,

$$4 \times \text{side} = 28.8 \text{ cm}$$
$$\text{Side} = \frac{28.8}{4} \text{ cm}$$
$$\text{Side} = 7.2 \text{ cm}$$

Thus, length of square is 7.2 cm. **Ans.**

6. Athlete take rounds of rectangular park $= 10$

Park is long $= 42$ m

Park is wide $= 40$ m

The, total distance covered by him $= 2 \,(\text{length} + \text{breadth}) \times 10$

$= 2(42 + 40) \text{ m} \times 10 = 2 \times 82 \times 10 \text{ m} = 1640 \text{ m}$

Thus, the total distance is 1640 m. **Ans.**

7. ∵ Rectangular table cover having breadth $= 4$ m and length $= 6$ m

Kavita required lace $= 2 \,(\text{breadth} + \text{length}) = 2 \,(4 \text{ m} + 6 \text{ m})$

$= 2 \times 10 \text{ m} = 20 \text{ m}$

Thus, Kavita required lace $= 20$ m **Ans.**

8. ∵ Rectangular park have length $= 350$ m and breadth $= 275$ m

The cost of fencing $= ₹ \, 26$ per metre

Perimeter of rectangular park $= 2$ (length + breadth)

$= 2\,(350 \text{ m} + 275 \text{ m}) = 2 \times 625 \text{ m} = 1250 \text{ m}$

∴The cost of fencing $= 1250 \text{ m} \times \, ₹ \, 26 \text{ m} = ₹ \, 32500$

Thus, the cost of fencing is $₹ \, 32500.$ **Ans.**

9. ∵ Length $= 450$ cm, breadth $= 3$ m or 3×100 cm $= 300$ cm

$$[∵ \, 1 \text{ m} = 100 \text{ m}]$$

∴Perimeter of a rectangle $= 2$ (length + breadth)

$= 2(450 + 300) \text{ cm} = 2 \times 750 \text{ cm}$

$= 1500 \text{ cm or } 15 \text{ m} \quad [∵ \, 1 \text{ cm} = \dfrac{1}{100} \text{ m}]$

Thus, the perimeter of rectangle is 1500 cm or 15 m **Ans.**

10. Rajesh walk in rectangular field.

whose, breadth $= 400$ m and length $= 600$ m

∵ He takes rounds $= 6$

Ramesh walk in square field, whose length or side $= 150$ m

∵ He takes rounds $= 8$

∴Perimeter of rectangle $= 2$ (length + breadth)

$= 2(600 + 400) \text{ m} = 2 \times 1000 \text{ m} = 2000 \text{ m}$

He walked total distance $= 2000 \text{ m} \times 6 \text{ rounds} = 12000 \text{ m}$

∴Perimeter of square $= 4 \times \text{side} = 4 \times 150 \text{ m} = 600 \text{ m}$

He walked total distance $= 600 \text{ m} \times 8 \text{ rounds} = 4800 \text{ m}$

So, Rajesh walked more by $= (12000 - 4800) \text{ m} = 7200 \text{ m}$

Thus, Rajesh walked more by 7200 m than Ramesh. **Ans.**

Exercise 13.2

1. (a) ∵ A side of a square $= \text{half or } \dfrac{1}{2}$

∴Area of square $= \text{side} \times \text{side} = \dfrac{1}{2} \times \dfrac{1}{2} = \dfrac{1}{4}$

Thus, area of square will be one fourth or $\dfrac{1}{4}.$ **Ans.**

(b) ∵ Side of square $= \text{doubled or } 2$

∴Area of square $= \text{side} \times \text{side} = 2 \times 2 = 4$

Thus, area of square will be four-times or 4. **Ans.**

(c) ∵ Side of square = trippled or 3

∴Area of square = side × side $= 3 \times 3 = 9$

Thus, area of square will be nine-times or 9.   **Ans.**

2. (a) ∵ Length of rectangle $=1$

Breadth of rectangle $= 2$

∴Area of rectangle = length × breadth $= 1 \times 2 = 2$

Thus, area of rectangle will became doubled or 2.   **Ans.**

(b) ∵ Length of rectangle $= 2$

Breadth of rectangle $= 1$

∴Area of rectangle = length × breadth $= 2 \times 1 = 2$

Thus, area of rectangle will became doubled or 2.   **Ans.**

(c) ∵ Length of rectangle $= 2$

Breadth of rectangle $= 2$

∴Area of rectangle = length × breadth $= 2 \times 2 = 4$

Thus, area of rectangle will became four-times or 4.   **Ans.**

3. (a) ∵ Length $= 22$ cm, Breadth $= 6$ cm

∴Area of rectangle = Length × Breadth

$$= 22 \text{ cm} \times 6 \text{ cm} = 132 \text{ cm}^2$$

Thus, area of rectangle is 132 cm^2.   **Ans.**

(b) ∵ Length $= 86$ m, Breadth $= 18$ m

∴Area of rectangle = Length × Breadth

$$= 86 \text{ m} \times 18 \text{ m} = 1548 \text{ m}^2$$

Thus, area of rectangle is 1548 m^2.   **Ans.**

(c) ∵ Length $= 48.5$ m, Breadth $= 21.5$ m

∴Area of rectangle = Length × Breadth $= 48.5 \text{ m} \times 21.5 \text{ m}$

$$= 1042.75 \text{ m}^2$$

Thus, area of rectangle is 1042.75 m^2.   **Ans.**

(d) ∵ Length $= 32$ m, Breadth $= 26$ m 60 cm

∴Area of rectangle = Length × Breadth

$$= 32 \text{ m} \times 26.60 \text{ m} = 851.2 \text{ m}^2$$

Thus, area of rectangle is 851.2 m^2.   **Ans.**

4. (a) ∵ Side of square $= 42$ cm

∴Area of square = side × side $= 42 \text{ cm} \times 42 \text{ cm} = 1764 \text{ cm}^2$

Thus, area of square is 1764 cm^2.   **Ans.**

(b) ∵ Side of square $= 26$ cm

∴Area of square $=$ side $\times$ side $= 26$ cm $\times 26$ cm $= 676$ cm^2.

Thus, area of square is 676 cm^2. **Ans.**

(c) ∵ Side of square $= 280$ m

∴Area of square $=$ side $\times$ side $= 280$ m $\times 280$ m $= 78400$ m^2

Thus, area of square is 78400 cm^2 . **Ans.**

(d) ∵ Side of square $= 413$ m

∴Area of square $=$ side $\times$ side $= 413$ m $\times 413$ m $= 170569$ m^2

Thus, area of square is 170569 m^2 **Ans.**

5. ∵ Length of floor $= 4$ m

Breadth of floor $= 7$ m

∴Area of rectangular floor $=$ length $\times$ breadth

$= 4$ m $\times 7$ m $= 28$ m^2.

∵ Side of square tile $= 0.25$ m

∴Area of square tile $=$ side $\times$ side $= 0.25$ m $\times 0.25$ m $= 0.0625$ m^2

Tiles are required to cover the floor $= \dfrac{\text{Area of rectangular floor}}{\text{Area of square tiles}}$

$$= \frac{28 \, \text{m}^2}{0.0625 \, \text{m}^2} = 448 \, \text{tiles}$$

Thus, Number of tiles Required are 448 tiles. **Ans.**

6. ∵ The length of a hall $= 28$ m

breadth of a hall $= 12$ m

∴Cost of floor carpet $=$ ₹ 32 per square metre.

∴Area of hall $=$ length $\times$ breadth $= 28$ m $\times 12$ m $= 336$ m^2

The cost of floor carpet $= 336$ m^2 $\times$ ₹ 32 $=$ ₹ 10752

Thus, the cost of floor carpet is ₹ 10752. **Ans.**

7. ∵ The side of square field $= 81$ m

∴Area of square field $=$ side $\times$ side $= 81$ m $\times$ 81 m $= 6561$ m^2

Thus, area of square field is 6561 m^2. **Ans.**

8. ∵ Length of rectangular field $= 164$ m

Breadth of rectangular field $= 20$ m

∴Area of rectangle $=$ Length $\times$ Breadth $= 164$ m $\times 20$ m $= 3280$ m^2

Thus, area of rectangular field is 3280 m^2. **Ans.**

9. ∵ Breadth of rectangular land $= 300\,\text{m}$
Length of rectangular land $= 400\,\text{m}$
The cost of tiling $=$ ₹ 18 per hundred sq meter
∴Area of rectangle $=$ length $\times$ breadth
$$= 400\,\text{m} \times 300\,\text{m} = 120000\,\text{m}^2$$
The cost of tiling $=$ ₹ $\dfrac{18}{100} \times 120000 =$ ₹ 21600

Thus, the cost of tiling is ₹ 21600. **Ans.**

10. ∵ The area of rectangular piece $= 45\,\text{sq cm}^2$
length of rectangular piece $= 15\,\text{cm}$
∴The area of rectangular piece $=$ Length $\times$ Breadth
$$45\,\text{cm}^2 = 15\,\text{cm} \times \text{Breadth}$$
$$\text{Breadth} = \frac{45\,\text{cm}^2}{15\,\text{cm}}$$
$$\text{Breadth} = 3\,\text{cm}$$
Thus, the breadth of rectangular piece is 3 cm. **Ans.**

11. ∵ Length of floor $= 6\,\text{m}$
Breadth of floor $= 4\,\text{m}$
Side of square carpet $= 2\,\text{m}$
∴Area of a rectangular floor floor $=$ Length $\times$ Breadth
$$= 6\,\text{m} \times 4\,\text{m} = 24\,\text{m}^2$$
Area of square carpet $=$ side $\times$ side $= 2\,\text{m} \times 2\,\text{m} = 4\,\text{m}^2$

Area of floor without carpet $=$ Area of floor $-$ Area of carpet
$$= 24\,\text{m}^2 - 4\,\text{m}^2 = 20\,\text{m}^2$$
Thus, the required area is 20 m^2. **Ans.**

Multiple Choice Questions

1. (i) d,   (ii) c,   (iii) d,   (iv) b,   (v) c,   (vi) d.

14. Data Handling

Exercise 14.1

1. The frequency distribution table will be as follows:

Out comes	Tally marks	Frequency
1	⊪⊩	4
2	𝍷𝍷𝍷𝍷 𝍷𝍷	7
3	𝍷𝍷𝍷𝍷 ⊪⊩⊩	10
4	𝍷𝍷𝍷𝍷 ⊪⊩	8
5	𝍷𝍷	2
6	⊪⊩	4
Total		35

2. The frequency table will be as follows:

Numbers	Tally marks	Frequency
0	⊪⊩	4
5	𝍷𝍷𝍷	3
7	𝍷𝍷𝍷𝍷 ⊪⊩⊩	9
8	𝍷𝍷𝍷𝍷 ⊪⊩	8
9	𝍷𝍷𝍷	3
10	𝍷𝍷𝍷	3
Total		30

3. The frequency table of children will be as follows:
Ascending order = 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 5, 5, 5, 5, 5, 5.

Number of children	Tally marks	Frequency
2	𝍷𝍷𝍷𝍷 𝍷𝍷𝍷𝍷 𝍷𝍷	12
3	𝍷𝍷𝍷𝍷 𝍷𝍷𝍷𝍷	10
4	𝍷𝍷	2
5	𝍷𝍷𝍷𝍷 𝍷	6
Total		30

4. (a) 35 kg is maximum weight in class.
   (b) 24 kg is minimum weight in class.
   (c) Range = maximum weight − minimum weight = 35 kg − 24 kg = 11 kg   **Ans.**
   (d) The frequency table will as follow:

Weight (in kg)	Tally marks	Frequency
24	|	1
25	||	2
28	||	2
29	||	2
30	||||| |	6
31	|||	3
32	||||	4
33	||	2
35	|||	3
Total		25

5. The frequency table will be as follow:

Numbers	Tally marks	Frequency
1	||||| ||	7
2	||||| ||	7
3							5
4	||||	4
5	|||	3
6	||||	4
Total		30

6. The frequency table will be as follows:

Number of marks	Tally marks	Frequency
5					3
7					3
8						4
12					3
14					3
15					3
19			1
Total		20

(a) Minimum score $= 5$ (b) Maximum score $= 19$
(c) Range = maximum − minimum $= 19 - 5 = 14$
(d) 3 students score minimum marks.

Exercise 14.2

1. (a) There are 420 rose flowers in the garden. There are 7 symbol present to express these data for rose garden.
Thus, total number of roses $= 7 \times 60 = 420$ **Ans.**
(b) Marigold garden has maximum flowers. There are 8 symbols to express these data. The number of symbols are greater than the other flowers.
$\therefore$ Number of Marigold flowers $= 8 \times 60 = 480$ **Ans.**
(c) Harsingar garden has minimum flowers. There are 4 symbol to express these data. The number of symbol are smaller than the other flowers.
$\therefore$ Number of flowers $= 4 \times 60 = 240$ **Ans.**

2. (a) There are 700 English books in library. There are 7 symbols present to express these data.
Thus, total number of English book $= 7 \times 100 = 700$ **Ans.**
(b) There are 250 maths books. There are 2 and a half $\left(\dfrac{1}{2} \right)$

symbol to express these data.
Thus, total number of maths book
$= 2 \times 100 + \dfrac{1}{2} \times 100 = 200 + 50 = 250$
Ans.

(c) English book are maximum in numbers. There are 7 symbols to express these data. The number of symbol are greater than the other books.

$\therefore$Number of English books $= 7 \times 100 = 700$ **Ans.**

(d) Maths books are minimum in number. There are 2 symbols and a half $\left(\dfrac{1}{2}\right)$ to express these data. The number of symbols are smaller than the other books.

$\therefore$Number of maths books $= 2 \times 100 + \dfrac{1}{2} \times 100 = 250$ **Ans.**

3. (a) There are 350 students who use scooter. There are 7 symbols to express these data. The number of symbol is 7.

$\therefore$Number of student's who use scooter $= 7 \times 50 = 350$ students **Ans.**

(b) yes

(c) The most popular mode of travel is by foot. There are 8 symbols to express these data. The number of symbol is 8.

$\therefore$Number of students' who travel by foot $= 8 \times 50 = 400$ students **Ans.**

4.

Games	= 20 student
Football	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
Hockey	☺ ☺ ☺ ☺ ☺ ☺ ☺
Cricket	☺ ☺ ☺ ☺ ☺ ☺
Kabaddi	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
Chess	☺ ☺

(a) There are 9 symbols represent for football and 2 symbols present for chess. **Ans.**

(b) There are 7 symbols represent for hockey. **Ans.**

(c) There are 2 symbols represent for chess. It is the least number symbols represent. **Ans.**

(d) There are 9 symbols represent for football. It is the maximum number of symbols represent. **Ans.**

5. (a) There are 210 bulbs sold on Friday. There are 7 symbols represent on Friday.

∴Number of bulbs $= 7 \times 30 = 210$ **Ans.**

(b) There are 330 bulbs sold on Tuesday. There are 11 symbols represent on Tuesday.

∴Number of bulbs $= 11 \times 30 = 330$ **Ans.**

(c) There are 270 bulbs sold on Sunday. There are 9 symbols represent on Sunday. So, the amount of bulbs $= 270 \times ₹ 10$
$= ₹ 2700$

Hence, the required sale is ₹ 2700. **Ans.**

(d) Yes.

Total sale of the week

$= 8 \times 30 + 11 \times 30 + 3 \times 30 + 5 \times 30 + 7 \times 30 + 8 \times 30 + 9 \times 30$

$= 240 + 330 + 90 + 150 + 210 + 240 + 270 = 1530 \text{ bulbs}$ **Ans.**

6. (a) In 2012, the sale of car is maximum because there are 6 symbols in this year and it is the highest symbol represent by the other years. **Ans.**

(b) In 2014, the sale of car is minimum because there are 3 symbols in these year and it is the least symbol represent by other years. **Ans.**

(c) There are 5000 cars sold in 2013. There are 5 symbols represent.

∴$5 \times 1000 = 5000$ cars. **Ans.**

(d) In 2011, the sale of car is 4000.

In 2015, the sale of car is 5000.

So, the increment in the sale of cars $= 5000 - 4000 = 1000$ cars.

Ans.

Exercise 14.3

1. (a) Russia has highest literacy.

(b) Australia has lowest literacy.

(c) India and Mexico has 80% literacy.

(d) Literacy in mexico is 80%.

(e) Brazil has highest literacy after Africa.

2. (a) The bar graph shows the number of the students of classes from 6 to 10, who were absent on Saturday.
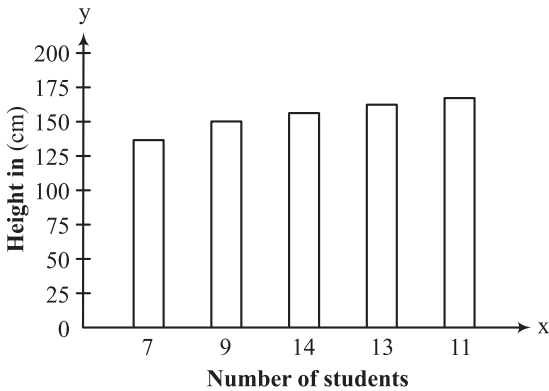
(b) Vertical axis shows number of student absent on Saturday and horizontal axis showes classes.

(c) In class IX, maximum students were absent.

Number of absent students $=12$

(d) In class X, number of absence is 4.

3.

(a) Total students $= 7 + 9 + 14 + 13 + 11 = 54$

Students have height more than 155 cm

$$= 13 + 11 = 24$$

$$\% = \frac{\text{Student have height more than 155 cm}}{\text{Total students}} \times 100$$

$$= \frac{24}{54} \times 100$$
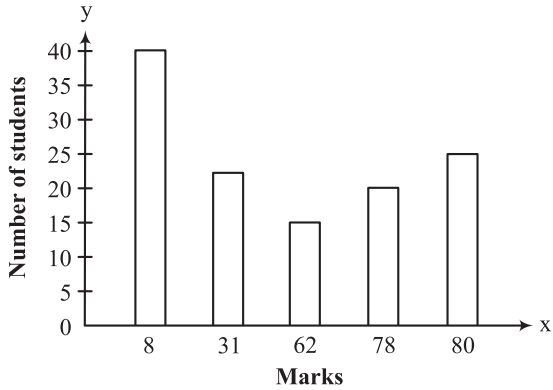
$$= \frac{1200}{27}\%$$

$$= 44\frac{12}{27}\%$$

$$= 44\frac{4}{9}\%$$ **Ans.**

(b) Students have height more than 160 cm $= 11$ students.   **Ans.**

4.

(a) Maximum marks obtained by $= 27$ students

Prize $= ₹\ 20$ each

So, the total money required for prize $= ₹\ 27 \times 20 = ₹\ 540$ **Ans.**

(b) Minimum marks obtained by 40 students.

Each student solve the questions $= 5$ everyday

So, the total questions $= 40 \times 5 = 200$ questions   **Ans.**