

ANSWERS



EXERCISE 1.1

- (a) Lahulspiti: -8°C , Srinagar: -2°C , Shimla: 5°C , Ooty: 14°C , Bangalore: 22°C
(b) 30°C (c) 6°C (d) Yes; No 2. 35
- -7°C ; -3°C 4. 6200 m 5. By a positive integer; Rs 358
- By a negative integer; -10 . 7. (ii) is the magic square
- (a) $<$ (b) $<$ (c) $>$ (d) $s <$
(e) $>$
- (i) 11 jumps (ii) 5 jumps (iii) (a) $-3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 = -8$
(b) $4 - 2 + 4 - 2 + 4 = 8$
8 in (b) represents going up 8 steps.

EXERCISE 1.2

- One such pair could be:
(a) $-10, 3$ (b) $-6, 4$; $(-6 - 4 = -10)$ (c) $-3, 3$
- One such pair could be:
(a) $-2, -10$; $[-2 - (-10) = 8]$ (b) $-6, 1$
(c) $-1, 2$; $(-1 - 2 = -3)$
- Scores of both the teams are same, i.e., -30 ; Yes
- (i) -5 (ii) 0 (iii) -17 (iv) -7
(v) -3

EXERCISE 1.3

- (a) -3 (b) -225 (c) 630 (d) 316 (e) 0
(f) 1320 (g) 162 (h) -360 (i) -24 (j) 36
- (i) $-a$ (ii) (a) 22 (b) -37 (c) 0
- $-1 \times 5 = -5$, $-1 \times 4 = -4 = -5 + 1$, $-1 \times 3 = -3 = -4 + 1$,
 $-1 \times 2 = -2 = -3 + 1$, $-1 \times 1 = -1 = -2 + 1$, $-1 \times 0 = 0 = -1 + 1$ so, $-1 \times (-1) = 0 + 1 = 1$.
- (a) 480 (b) -53000 (c) -15000 (d) -4182
(e) -62500 (f) 336 (g) 493 (h) 1140
- -10°C 7. (i) 8 (ii) 15 (iii) 0
- (a) Loss of Rs 1000 (b) 4000 bags
- (a) -9 (b) -7 (c) 7 (d) -11

EXERCISE 1.4

1. (a) -3 (b) -10 (c) 4 (d) -1
 (e) -13 (f) 0 (g) 1 (h) -1 (i) 1
3. (a) 1 (b) 75 (c) -206 (d) -1
 (e) -87 (f) -48 (g) -10 (h) -12
4. $(-6, 2), (-12, 4), (12, -4), (9, -3), (-9, 3)$ (There could be many such pairs)
5. $9 \text{ p.m.}; -14^\circ\text{C}$ 6. (i) 8 (ii) 13 7. 1 hour

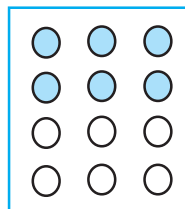
EXERCISE 2.1

1. (i) $\frac{7}{5}$ (ii) $\frac{39}{8} 4\frac{7}{8}$ (iii) $\frac{31}{35}$ (iv) $\frac{91}{165}$
 (v) $\frac{13}{5} 2\frac{3}{5}$ (vi) $\frac{37}{6} 6\frac{1}{6}$ (vii) $\frac{39}{8} 4\frac{7}{8}$
2. (i) $\frac{2}{3}, \frac{8}{21}, \frac{2}{9}$ (ii) $\frac{7}{10}, \frac{3}{7}, \frac{1}{5}$ 3. Yes 4. $\frac{139}{3} 46\frac{1}{3} \text{ cm}$
5. (i) $8\frac{17}{20} \text{ cm}$ (ii) $7\frac{5}{6} \text{ cm}$; Perimeter of $\triangle ABE$ is greater.
6. $\frac{3}{10} \text{ cm}$ 7. $\frac{2}{5}$; Ritu; $\frac{1}{5}$ 8. Vaibhav; by $\frac{1}{6}$ of an hour.

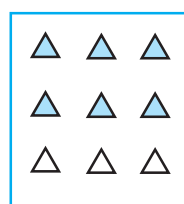
EXERCISE 2.2

1. (i) (d) (ii) (b) (iii) (a) (iv) (c)
2. (i) (c) (ii) (a) (iii) (b)
3. (i) $4\frac{1}{5}$ (ii) $1\frac{1}{3}$ (iii) $1\frac{5}{7}$ (iv) $1\frac{1}{9}$ (v) $2\frac{2}{3}$
 (vi) 15 (vii) $6\frac{2}{7}$ (viii) 16 (ix) $4\frac{1}{3}$ (x) 9

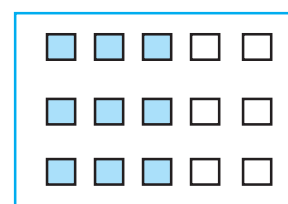
4. One way of doing this is:



(i)



(ii)



(iii)

5. (a) (i) 12 (ii) 23 (b) (i) 12 (ii) 18 (c) (i) 12 (ii) 27 (d) (i) 16 (ii) 28

6. (a) $15\frac{3}{5}$ (b) $33\frac{3}{4}$ (c) $15\frac{3}{4}$ (d) $25\frac{1}{3}$
 (e) $19\frac{1}{2}$ (f) $27\frac{1}{5}$
7. (a) (i) $1\frac{3}{8}$ (ii) $2\frac{1}{9}$ (b) (i) $2\frac{19}{48}$ (ii) $6\frac{1}{24}$ 8. (i) 2 litres (ii) $\frac{3}{5}$

EXERCISE 2.3

1. (i) (a) $\frac{1}{16}$ (b) $\frac{3}{20}$ (c) $\frac{1}{3}$ (ii) (a) $\frac{2}{63}$ (b) $\frac{6}{35}$ (c) $\frac{3}{70}$
2. (i) $1\frac{7}{9}$ (ii) $\frac{2}{9}$ (iii) $\frac{9}{16}$ (iv) $1\frac{2}{25}$
 (v) $\frac{5}{8}$ (vi) $1\frac{13}{20}$ (vii) $1\frac{13}{48}$
3. (i) $2\frac{1}{10}$ (ii) $4\frac{44}{45}$ (iii) 8 (iv) $2\frac{1}{42}$ (v) $1\frac{33}{35}$ (vi) $7\frac{4}{5}$ (vii) $2\frac{1}{7}$
4. (i) $\frac{3}{5}$ of $\frac{5}{8}$ (ii) $\frac{1}{2}$ of $\frac{6}{7}$ 5. $2\frac{1}{4}$ m 6. $10\frac{1}{2}$ hours 7. 44 km
8. (a) (i) $\frac{5}{10}$ (ii) $\frac{1}{2}$ (b) (i) $\frac{8}{15}$ (ii) $\frac{8}{15}$

EXERCISE 2.4

1. (i) 16 (ii) $\frac{84}{5}$ (iii) $\frac{24}{7}$ (iv) $\frac{3}{2}$ (v) $\frac{9}{7}$ (vi) $\frac{7}{5}$
2. (i) $\frac{7}{3}$ (improper fraction) (ii) $\frac{8}{5}$ (improper fraction) (iii) $\frac{7}{9}$ (proper fraction)
 (iv) $\frac{5}{6}$ (proper fraction) (v) $\frac{7}{12}$ (proper fraction) (vi) 8 (whole number)
 (vii) 11 (whole number)
3. (i) $\frac{7}{6}$ (ii) $\frac{4}{45}$ (iii) $\frac{6}{91}$ (iv) $\frac{13}{9}$ (v) $\frac{7}{8}$ (vi) $\frac{31}{49}$
4. (i) $\frac{4}{5}$ (ii) $\frac{2}{3}$ (iii) $\frac{3}{8}$ (iv) $\frac{35}{9}$ (v) $\frac{21}{16}$ (vi) $\frac{4}{15}$
 (vii) $\frac{48}{25}$ (viii) $\frac{11}{6}$

EXERCISE 2.5

1. (i) 0.5 (ii) 0.7 (iii) 7 (iv) 1.49 (v) 2.30 (vi) 0.88
2. (i) Rs 0.07 (ii) Rs 7.07 (iii) Rs 77.77 (iv) Rs 0.50 (v) Rs 2.35
3. (i) 0.05m, 0.00005 km (ii) 3.5 cm, 0.035m, 0.000035 km
4. (i) 0.2 kg (ii) 3.470 kg (iii) 4.008 kg
5. (i) $2 \times 10 + 0 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100}$ (ii) $2 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100}$
- (iii) $2 \times 100 + 0 \times 10 + 0 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100}$
- (iv) $2 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100} + 4 \times \frac{1}{1000}$
6. (i) Ones (ii) Hundredths (iii) Tenths (iv) Hundredths (v) Thousandths
7. Ayub travelled more by 0.9 km or 900 m 8. Sarala bought more fruits 9. 14.6 km

EXERCISE 2.6

1. (i) 1.2 (ii) 36.8 (iii) 13.55 (iv) 80.4 (v) 0.35 (vi) 844.08
(vii) 1.72
2. 17.1 cm²
3. (i) 13 (ii) 368 (iii) 1537 (iv) 1680.7 (v) 3110 (vi) 15610
(vii) 362 (viii) 4307 (ix) 5 (x) 0.8 (xi) 90 (xii) 30
4. 553 km 5. (i) 0.75 (ii) 5.17 (iii) 63.36 (iv) 4.03 (v) 0.025
(vi) 1.68 (vii) 0.0214 (viii) 10.5525 (ix) 1.0101 (x) 110.011

EXERCISE 2.7

1. (i) 0.2 (ii) 0.07 (iii) 0.62 (iv) 10.9 (v) 162.8 (vi) 2.07
(vii) 0.99 (viii) 0.16
2. (i) 0.48 (ii) 5.25 (iii) 0.07 (iv) 3.31 (v) 27.223 (vi) 0.056
(vii) 0.397
3. (i) 0.027 (ii) 0.003 (iii) 0.0078 (iv) 4.326 (v) 0.236 (vi) 0.9853
4. (i) 0.0079 (ii) 0.0263 (iii) 0.03853 (iv) 0.1289 (v) 0.0005
5. (i) 2 (ii) 180 (iii) 6.5 (iv) 44.2 (v) 2 (vi) 31
(vii) 510 (viii) 27 (ix) 2.1 6. 18 km

EXERCISE 3.1

2.

| Marks | Tally Marks | Frequency |
|-------|-------------|-----------|
| 1 | | 1 |
| 2 | | 2 |

| | | |
|---|--|---|
| 3 | | 1 |
| 4 | | 3 |
| 5 | | 5 |
| 6 | | 4 |
| 7 | | 2 |
| 8 | | 1 |
| 9 | | 1 |

(i) 9

(ii) 1

(iii) 8

(iv) 5

3. 2

4. 50

5. (i) 12.5

(ii) 3

(iii) $\frac{0+8+6+4}{4} = \frac{18}{4}$ or $\frac{9}{2}$

(iv) A

6. (i) Highest marks = 95, Lowest marks = 39

(ii) 56

(iii) 73

7. 2058

8. (i) 20.5 (ii) 5.9 (iii) 5

9. (i) 151 cm

(ii) 128 cm

(iii) 23 cm

(iv) 141.4 cm

(v) 5

EXERCISE 3.2

1. Mode = 20, Median = 20, Yes.

2. Mean = 39, Mode = 15, Median = 15, No.

3. (i) Mode = 38, 43; Median = 40

(ii) Yes, there are 2 modes.

4. Mode = 14, Median = 14

5. (i) T

(ii) F

(iii) T

(iv) F

EXERCISE 3.3

1. (a) Cat

(b) 8

4. (i) Maths

(ii) S. Science

(iii) Hindi

5. (ii) Cricket

(iii) Watching sports

6. (i) Jammu

(ii) Jammu, Bangalore

(iii) Bangalore and Jaipur or Bangalore and Ahmedabad

(iv) Mumbai

EXERCISE 3.4

1. (i) Certain to happen

(ii) Can happen but not certain

(iii) Impossible

(iv) Can happen but not certain

(v) Can happen but not certain

2. (i) $\frac{1}{6}$ (ii) $\frac{1}{6}$ 3. $\frac{1}{2}$ **EXERCISE 4.1**

1. (i) No.

(ii) No

(iii) Yes

(iv) No

(v) Yes

(vi) No

(vii) Yes

(viii) No

(ix) No

(x) No

(xi) Yes

2. (a) No (b) No (c) Yes (d) No (e) No (f) No
3. (i) $p = 3$ (ii) $m = 6$
4. (i) $x + 4 = 9$ (ii) $y - 2 = 8$ (iii) $10a = 70$ (iv) $\frac{b}{5} = 6$
- (v) $\frac{3t}{4} = 15$ (vi) $7m + 7 = 77$ (vii) $\frac{x}{4} - 4 = 4$ (viii) $6y - 6 = 60$
- (ix) $\frac{z}{3} = 30$
5. (i) The sum of p and 4 is 15 (ii) 7 subtracted from m is 3
 (iii) Twice a number m is 7 (iv) One-fifth of a number m is 3
 (v) Three-fifth of a number m is 6 (vi) Three times a number p when added to 4 gives 25
 (vii) 2 subtracted from four times a number p is 18
 (viii) Add 2 to half of a number p to get 8
6. (i) $5m + 7 = 37$ (ii) $3y + 4 = 49$ (iii) $2l + 7 = 87$ (iv) $4b = 180^\circ$

EXERCISE 4.2

1. (a) Add 1 to both sides; $x = 1$ (b) Subtract 1 from both sides; $x = -1$
 (c) Add 1 to both sides; $x = 6$ (d) Subtract 6 from both sides; $x = -4$
 (e) Add 4 to both sides; $y = -3$ (f) Add 4 to both sides; $y = 8$
 (g) Subtract 4 from both sides; $y = 0$ (h) Subtract 4 from both sides; $y = -8$
2. (a) Divide both sides by 3; $l = 14$ (b) Multiply both sides by 2; $b = 12$
 (c) Multiply both sides by 7; $p = 28$ (d) Divide both sides by 4; $x = \frac{25}{4}$
 (e) Divide both sides by 8; $y = \frac{36}{8}$ (f) Multiply both sides by 3; $z = \frac{15}{4}$
 (g) Multiply both sides by 5; $a = \frac{7}{3}$ (h) Divide both sides by 20; $t = \frac{1}{2}$
3. (a) Step 1: Add 2 to both sides (b) Step 1: Subtract 7 from both sides
 Step 2: Divide both sides by 3; $n = 16$ Step 2: Divide both sides by 5; $m = 2$
 (c) Step 1: Multiply both sides by 3 (d) Step 1: Multiply both sides 10
 Step 2: Divide both sides by 20; $p = 6$ Step 2: Divide both sides by 3; $p = 20$
4. (a) $p = 10$ (b) $p = 9$ (c) $p = 20$ (d) $p = -15$ (e) $p = 8$ (f) $s = -3$
 (g) $s = -4$ (h) $s = 0$ (i) $q = 3$ (j) $q = 3$ (k) $q = -3$ (l) $q = 3$

EXERCISE 4.3

1. (a) $y = 8$ (b) $t = \frac{18}{5}$ (c) $a = -5$ (d) $q = -8$ (e) $x = -4$ (f) $x = \frac{5}{2}$
 (g) $m = \frac{1}{2}$ (h) $z = -2$ (i) $l = \frac{4}{9}$ (j) $b = 12$
2. (a) $x = 2$ (b) $n = 12$ (c) $n = -2$ (d) $y = 4$ (e) $x = \frac{17}{4}$
 (f) $x = -\frac{1}{4}$ (g) $p = 7$ (h) $p = 7$
3. (a) $p = \frac{14}{5}$ (b) $p = \frac{6}{5}$ (c) $p = -\frac{6}{5}$ (d) $t = 0$ (e) $t = 3$ (f) $m = 2$
4. (a) Equations are: $10x + 2 = 22$; $\frac{x}{5} = \frac{2}{5}$; $5x - 3 = 7$
 (b) Equations are: $3x = -6$; $3x + 7 = 1$; $3x + 10 = 4$

EXERCISE 4.4

1. (a) $8x + 4 = 60$; $x = 7$ (b) $\frac{x}{5} - 4 = 3$; $x = 35$ (c) $\frac{3}{4}y + 3 = 21$; $y = 24$
 (d) $2m - 11 = 15$; $m = 13$ (e) $50 - 3x = 8$; $x = 14$ (f) $\frac{x+19}{5} = 8$; $x = 21$
 (g) $\frac{5n}{2} - 7 = \frac{11}{2}$; $n = 5$
2. (a) Lowest score = 40 (b) 70° each (c) Sachin: 132 runs, Rahul: 66 runs
3. (i) 6 (ii) 15 years (iii) 25 4. 30

EXERCISE 5.1

1. (i) 70° (ii) 27° (iii) 33°
 2. (i) 75° (ii) 93° (iii) 26°
 3. (i) supplementary (ii) complementary (iii) supplementary
 (iv) supplementary (v) complementary (vi) complementary
 4. 45° 5. 90° 6. $\angle 2$ will increase with the same measure as the decrease in $\angle 1$.
 7. (i) No (ii) No (iii) Yes 8. Less than 45°
 9. (i) Yes (ii) No (iii) Yes (iv) Yes (v) Yes (vi) $\angle COB$
 10. (i) $\angle 1, \angle 4$; $\angle 5, \angle 2 + \angle 3$ (ii) $\angle 1, \angle 5$; $\angle 4, \angle 5$
 11. $\angle 1$ and $\angle 2$ are not adjacent angles because their vertex is not common.
 12. (i) $x = 55^\circ, y = 125^\circ, z = 125^\circ$ (ii) $x = 115^\circ, y = 140^\circ, z = 40^\circ$
 13. (i) 90° (ii) 180° (iii) supplementary (iv) linear pair (v) equal
 (vi) obtuse angles

14. (i) $\angle AOD, \angle BOC$ (ii) $\angle EOA, \angle AOB$ (iii) $\angle EOB, \angle EOD$
 (iv) $\angle EOA, \angle EOC$ (v) $\angle AOB, \angle AOE; \angle AOE, \angle EOD; \angle EOD, \angle COD$

EXERCISE 5.2

1. (i) Corresponding angle property (ii) Alternate interior angle property
 (iii) Interior angles on the same side of the transversal are supplementary
2. (i) $\angle 1, \angle 5; \angle 2, \angle 6; \angle 3, \angle 7; \angle 4, \angle 8$ (ii) $\angle 2, \angle 8; \angle 3, \angle 5$
 (iii) $\angle 2, \angle 5; \angle 3, \angle 8$ (iv) $\angle 1, \angle 3; \angle 2, \angle 4; \angle 5, \angle 7; \angle 6, \angle 8$
3. $a = 55^\circ; b = 125^\circ; c = 55^\circ; d = 125^\circ; e = 55^\circ; f = 55^\circ$
4. (i) $x = 70^\circ$ (ii) $x = 60^\circ$ (iii) $x = 100^\circ$
5. (i) $\angle DGC = 70^\circ$ (ii) $\angle DEF = 70^\circ$
6. (i) l is not parallel to m (ii) l is not parallel to m
 (iii) l is parallel to m (iv) l is not parallel to m

EXERCISE 6.1

1. Altitude, Median, No.

EXERCISE 6.2

1. (i) 120° (ii) 110° (iii) 70° (iv) 120° (v) 100° (vi) 90°
 2. (i) 65° (ii) 30° (iii) 35° (iv) 60° (v) 50° (vi) 40°

EXERCISE 6.3

1. (i) 70° (ii) 60° (iii) 40° (iv) 65° (v) 60° (vi) 30°
 2. (i) $x = 70^\circ, y = 60^\circ$ (ii) $x = 50^\circ, y = 80^\circ$ (iii) $x = 110^\circ, y = 70^\circ$
 (iv) $x = 60^\circ, y = 90^\circ$ (v) $x = 45^\circ, y = 90^\circ$ (vi) $x = 60^\circ, y = 60^\circ$

EXERCISE 6.4

1. (i) Not possible (ii) Possible (iii) Not possible
 2. (i) Yes (ii) Yes (iii) Yes 3. Yes 4. Yes 5. No
 6. Between 3 and 27

EXERCISE 6.5

1. 26 cm 2. 24 cm 3. 9 m 4. (i) and (iii) 5. 18m 6. (ii)
 7. 98 cm 8. 68 cm

EXERCISE 7.1

1. (a) they have the same length (b) 70° (c) $m\angle A = m\angle B$
 3. $\angle A \leftrightarrow \angle F, \angle B \leftrightarrow \angle E, \angle C \leftrightarrow \angle D,$ $\overline{AB} \leftrightarrow \overline{FE}, \overline{BC} \leftrightarrow \overline{ED}, \overline{AC} \leftrightarrow \overline{FD}$
 4. (i) $\angle C$ (ii) \overline{CA} (iii) $\angle A$ (iv) \overline{BA}

EXERCISE 7.2

- (a) SSS Congruence criterion (b) SAS Congruence criterion
(c) ASA Congruence criterion (d) RHS Congruence criterion
- (a) (i) PE (ii) EN (iii) PN (b) (i) EN (ii) AT
(c) (i) $\angle RAT = \angle EPN$ (ii) $\angle ATR = \angle PNE$
- (i) Given (ii) Given (iii) Common (iv) SAS Congruence criterion 4. No
- $\triangle WON$ 6. $\triangle BTA, \triangle TPQ$ 9. $BC = QR$, ASA Congruence criterion

EXERCISE 8.1

- (a) 10:1 (b) 500:7 (c) 100:3 (d) 20:1 2. 12 computers
- (i) Rajasthan : 190 people ; UP : 830 people (ii) Rajasthan

EXERCISE 8.2

- (a) 12.5% (b) 125% (c) 7.5% (d) $28\frac{4}{7}\%$
- (a) 65% (b) 210% (c) 2% (d) 1235%
- (i) $\frac{1}{4}, 25\%$ (ii) $\frac{3}{5}; 60\%$ (iii) $\frac{3}{8}; 37.5\%$
- (a) 37.5 (b) $\frac{3}{5}$ minute or 36 seconds (c) Rs 500
(d) 0.75 kg or 750 g
- (a) 12000 (b) Rs 9,000 (c) 1250 km (d) 20 minutes (e) 500 litres
- (a) $0.25; \frac{1}{4}$ (b) $1.5; \frac{3}{2}$ (c) $0.2; \frac{1}{5}$ (d) $0.05; \frac{1}{20}$ 7. 30%
- 40%; 6000 9. Rs 4,000 10. 5 matches

EXERCISE 8.3

- (a) Profit = Rs 75; Profit % = 30 (b) Profit = Rs 1500; Profit % = 12.5
(c) Profit = Rs 500; Profit % = 20 (d) Loss = Rs 100; Loss % = 40
- (a) 75%; 25% (b) 20%, 30%, 50% (c) 20%; 80% (d) 12.5%; 25%; 62.5%
- 2% 4. $5\frac{5}{7}\%$ 5. Rs 12,000 6. Rs 16,875
- (i) 12% (ii) 25 g 8. Rs 233.75 9. (a) Rs 1,632 (b) Rs 8,625
- 0.25% 11. Rs 500

EXERCISE 9.1

1. (i) $\frac{2}{3}, \frac{1}{2}, \frac{2}{5}, \frac{1}{3}, \frac{2}{7}$

(ii) $\frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{10}{7}, \frac{9}{5}$

(iii) $\frac{35}{45}, \frac{7}{9}, \frac{34}{45}, \frac{33}{45}, \frac{11}{15}, \frac{32}{45}, \frac{31}{45}$

(iv) $\frac{1}{3}, \frac{1}{4}, 0, \frac{1}{3}, \frac{1}{2}$

2. (i) $\frac{15}{25}, \frac{18}{30}, \frac{21}{35}, \frac{24}{40}$

(ii) $\frac{4}{16}, \frac{5}{20}, \frac{6}{24}, \frac{7}{28}$

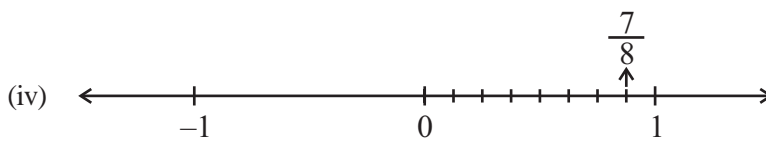
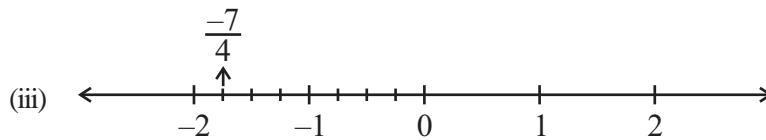
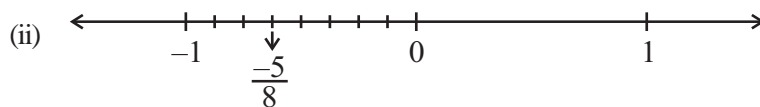
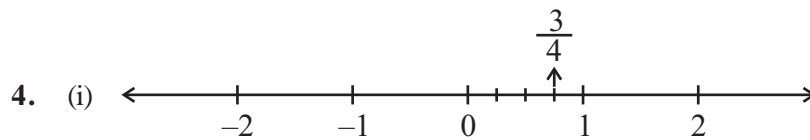
(iii) $\frac{5}{30}, \frac{6}{36}, \frac{7}{42}, \frac{8}{48}$

(iv) $\frac{8}{12}, \frac{10}{15}, \frac{12}{18}, \frac{14}{21}$

3. (i) $\frac{4}{14}, \frac{6}{21}, \frac{8}{28}, \frac{10}{35}$

(ii) $\frac{10}{6}, \frac{15}{9}, \frac{20}{12}, \frac{25}{15}$

(iii) $\frac{8}{18}, \frac{12}{27}, \frac{16}{36}, \frac{28}{63}$



5. P represents $\frac{7}{3}$ Q represents $\frac{8}{3}$ R represents $\frac{4}{3}$ S represents $\frac{5}{3}$

6. (ii), (iii), (iv), (v)

7. (i) $\frac{4}{3}$ (ii) $\frac{5}{9}$ (iii) $\frac{11}{18}$ (iv) $\frac{4}{5}$

8. (i) < (ii) < (iii) = (iv) > (v) < (vi) = (vii) >

9. (i) $\frac{5}{2}$ (ii) $\frac{5}{6}$ (iii) $\frac{2}{3}$ (iv) $\frac{1}{4}$ (v) $3\frac{2}{7}$

10. (i) $\frac{3}{5}, \frac{2}{5}, \frac{1}{5}$ (ii) $\frac{4}{3}, \frac{1}{3}, \frac{2}{9}$ (iii) $\frac{3}{2}, \frac{3}{4}, \frac{3}{7}$

EXERCISE 9.2

1. (i) $\frac{3}{2}$ (ii) $\frac{34}{15}$ (iii) $\frac{17}{30}$ (iv) $\frac{82}{99}$
 (v) $\frac{26}{57}$ (vi) $\frac{2}{3}$ (vii) $\frac{34}{15}$
2. (i) $\frac{13}{72}$ (ii) $\frac{23}{63}$ (iii) $\frac{1}{195}$ (iv) $\frac{89}{88}$ (v) $\frac{73}{9}$
3. (i) $\frac{63}{8}$ (ii) $\frac{27}{10}$ (iii) $\frac{54}{55}$ (iv) $\frac{6}{35}$ (v) $\frac{6}{55}$
 (vi) 1
4. (i) -6 (ii) $\frac{3}{10}$ (iii) $\frac{4}{15}$ (iv) $\frac{1}{6}$ (v) $\frac{14}{13}$
 (vi) $\frac{91}{24}$ (vii) $\frac{15}{4}$

EXERCISE 11.1

1. (i) 150000 m² (ii) Rs 1,500,000,000
 2. 6400 m² 3. 20 m 4. 15 cm; 525 cm² 5. 40 m
 6. 31cm; Square 7. 35cm; 1050 cm² 8. Rs 284

EXERCISE 11.2

1. (a) 28 cm² (b) 15 cm² (c) 8.75 cm² (d) 24 cm² (e) 8.8 cm²
 2. (a) 6 cm² (b) 8 cm² (c) 6 cm² (d) 3 cm²
 3. (a) 12.3 cm (b) 10.3 cm (c) 5.8 cm (d) 1.05 cm
 4. (a) 11.6 cm (b) 80 cm (c) 15.5 cm
 5. (a) 91.2 cm² (b) 11.4 cm
 6. length of BM = 30cm; length of DL = 42 cm
 7. Area of $\triangle ABC = 30 \text{ cm}^2$; length of AD = $\frac{60}{13}$ cm
 8. Area of $\triangle ABC = 27 \text{ cm}^2$; length of CE = 7.2 cm

EXERCISE 11.3

1. (a) 88 cm (b) 176 mm (c) 132 cm
 2. (a) 616 mm² (b) 1886.5 m² (c) $\frac{550}{7}$ cm²

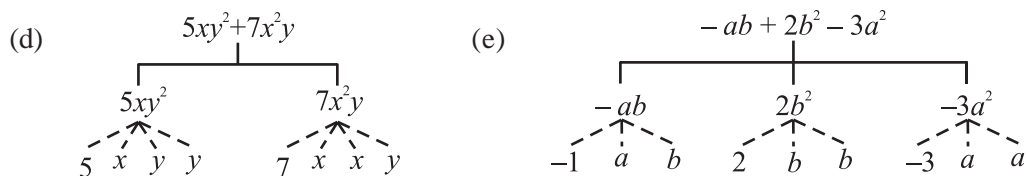
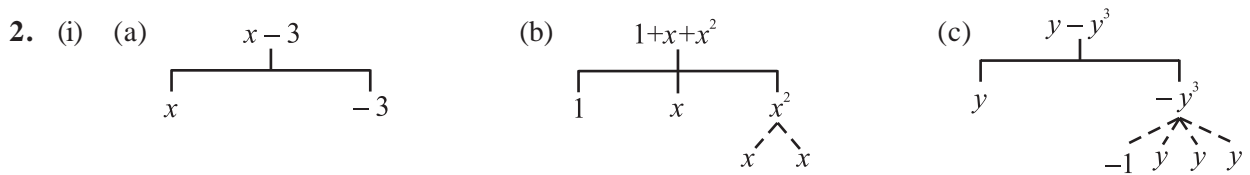
3. 24.5 m; 1886.5 m² 4. 132 m; Rs 528 5. 21.98 cm²
 6. 4.71 m; Rs 70.65 7. 25.7 cm 8. Rs 30.14 (approx.) 9. 7 cm; 154 cm²; 11cm; circle.
 10. 536 cm² 11. 23.44 cm² 12. 5 cm; 78.5 cm² 13. 879.20 m²
 14. Yes 15. 119.32 m; 56.52m 16. 200 Times 17. 94.2 cm

EXERCISE 11.4

1. 1750 m²; 0.675 ha 2. 1176 m² 3. 30 cm²
 4. (i) 63 m² (ii) Rs 12,600 5. (i) 116 m² (ii) Rs 31,360
 6. 0.99 ha; 1.2 ha 7. (i) 441 m² (ii) Rs 48,510 8. Yes, 9.12 m cord is left
 9. (i) 50m² (ii) 12.56 m² (iii) 37.44m² (iv) 12.56m
 10. (i) 110 cm² (ii) 150 cm²; 11.66 cm²

EXERCISE 12.1

1. (i) $y - z$ (ii) $\frac{1}{2}(x + y)$ (iii) z^2 (iv) $\frac{1}{4}pq$ (v) $x^2 + y^2$ (vi) $5 + 3mn$
 (vii) $10 - yz$ (viii) $ab - (a + b)$



(ii)

| | Expression | Terms | Factors |
|-----|----------------|-------------------|---------------------------|
| (a) | $-4x + 5$ | $-4x$ 5 | $-4, x$ 5 |
| (b) | $-4x + 5y$ | $-4x$ $5y$ | $-4, x$ $5, y$ |
| (c) | $5y + 3y^2$ | $5y$ $3y^2$ | $5, y$ $3, y, y$ |
| (d) | $xy + 2x^2y^2$ | xy $2x^2y^2$ | x, y $2, x, x, y, y$ |
| (e) | $pq + q$ | pq q | p, q q |

| | | | |
|-----|------------------------------|---------------------------------------|---|
| (f) | $1.2ab - 2.4b + 3.6a$ | $1.2ab$ $-2.4b$ $3.6a$ | $1.2, a, b$ $-2.4, b$ $3.6, a$ |
| (g) | $\frac{3}{4}x - \frac{1}{4}$ | $\frac{3}{4}x$ | $\frac{3}{4}, x$ |
| (h) | $0.1p^2 + 0.2q^2$ | $\frac{1}{4}$ $0.1p^2$ $0.2q^2$ | $\frac{1}{4}$ $0.1, p, p$ $0.2, q, q$ |

3.

| | Expression | Terms | Coefficients |
|--------|---------------------|-----------------------|-------------------|
| (i) | $5 - 3t^2$ | $-3t^2$ | -3 |
| (ii) | $1 + t + t^2 + t^3$ | t t^2 t^3 | 1 1 1 |
| (iii) | $x + 2xy + 3y$ | x $2xy$ $3y$ | 1 2 3 |
| (iv) | $100m + 1000n$ | $100m$ $1000n$ | 100 1000 |
| (v) | $-p^2q^2 + 7pq$ | $-p^2q^2$ $7pq$ | -1 7 |
| (vi) | $1.2a + 0.8b$ | $1.2a$ $0.8b$ | 1.2 0.8 |
| (vii) | $3.14r^2$ | $3.14r^2$ | 3.14 |
| (viii) | $2(l + b)$ | $2l$ $2b$ | 2 2 |
| (ix) | $0.1y + 0.01y^2$ | $0.1y$ $0.01y^2$ | 0.1 0.01 |

4. (a)

| | Expression | Terms with x | Coefficient of x |
|-------|---------------|----------------|--------------------|
| (i) | $y^2x + y$ | y^2x | y^2 |
| (ii) | $13y^2 - 8yx$ | $-8yx$ | $-8y$ |
| (iii) | $x + y + 2$ | x | 1 |
| (iv) | $5 + z + zx$ | zx | z |

| | | | |
|-------|---------------|-------------|------------|
| (v) | $1 + x + xy$ | x xy | 1 y |
| (vi) | $12xy^2 + 25$ | $12xy^2$ | $12y^2$ |
| (vii) | $7 + xy^2$ | xy^2 | y^2 |

(b)

| | Expression | Terms with y^2 | Coefficient of y^2 |
|-------|-------------------------|---------------------|----------------------|
| (i) | $8 - xy^2$ | $-xy^2$ | $-x$ |
| (ii) | $5y^2 + 7x$ | $5y^2$ | 5 |
| (iii) | $2x^2y - 15xy^2 + 7y^2$ | $-15xy^2$ $7y^2$ | $-15x$ 7 |

5. (i) binomial (ii) monomial (iii) trinomial (iv) monomial
 (v) trinomial (vi) binomial (vii) binomial (viii) monomial
 (ix) trinomial (x) binomial (xi) binomial (xii) trinomial
6. (i) like (ii) like (iii) unlike (iv) like
 (v) unlike (vi) unlike
7. (a) $-xy^2, 2xy^2; -4yx^2, 20x^2y; 8x^2, -11x^2, -6x^2; 7y, y; -100x, 3x; -11yx, 2xy.$
 (b) $10pq, -7qp, 78qp; 7p, 2405p; 8q, -100q; -p^2q^2, 12q^2p^2; -23, 41; -5p^2, 701p^2; 13p^2q, qp^2$

EXERCISE 12.2




1. (i) $8b - 32$ (ii) $7z^3 + 12z^2 - 20z$ (iii) $p - q$ (iv) $a + ab$
 (v) $8x^2y + 8xy^2 - 4x^2 - 7y^2$ (vi) $4y^2 - 3y$
2. (i) $2mn$ (ii) $-5tz$ (iii) $12mn - 4$ (iv) $a + b + 3$
 (v) $7x + 5$ (vi) $3m - 4n - 3mn - 3$ (vii) $9x^2y - 8xy^2$
 (viii) $5pq + 20$ (ix) 0 (x) $-x^2 - y^2 - 1$
3. (i) $6y^2$ (ii) $-18xy$ (iii) $2b$ (iv) $5a + 5b - 2ab$
 (v) $5m^2 - 8mn + 8$ (vi) $x^2 - 5x - 5$
 (vii) $10ab - 7a^2 - 7b^2$ (viii) $8p^2 + 8q^2 - 5pq$
4. (a) $x^2 + 2xy - y^2$ (b) $5a + b - 6$
5. $4x^2 - 3y^2 - xy$
6. (a) $-y + 11$ (b) $2x + 4$

EXERCISE 12.3

1. (i) 0 (ii) 1 (iii) -1 (iv) 1 (v) 1
2. (i) -1 (ii) -13 (iii) 3 3. (i) -9 (ii) 3 (iii) 0 (iv) 1

4. (i) 8 (ii) 4 (iii) 0 5. (i) -2 (ii) 2 (iii) 0 (iv) 2
 6. (i) $5x - 13$; -3 (ii) $8x - 1$; 15 (iii) $11x - 10$; 12 (iv) $11x + 7$; 29
 7. (i) $2x + 4$; 10 (ii) $-4x + 6$; -6 (iii) $-5a + 6$; 11 (iv) $-8b + 6$; 22 (v) $3a - 2b - 9$; -8
 8. (i) 1000 (ii) 20 9. -5 10. $2a^2 + ab + 3$; 38

EXERCISE 12.4

| 1. | Symbol | Number of Digits | Number of Segments |
|----|---|------------------|--------------------|
| 6 |  | 5 | 26 |
| | | 10 | 51 |
| | | 100 | 501 |
| 4 |  | 5 | 16 |
| | | 10 | 31 |
| | | 100 | 301 |
| 8 |  | 5 | 27 |
| | | 10 | 52 |
| | | 100 | 502 |

2. (i) $2n - 1 \rightarrow 100^{\text{th}}: 199$
 (ii) $3n + 2 \rightarrow 5^{\text{th}}: 17$;
 $10^{\text{th}}: 32$;
 $100^{\text{th}}: 302$
 (iii) $4n + 1 \rightarrow 5^{\text{th}}: 21$;
 $10^{\text{th}}: 41$;
 $100^{\text{th}}: 401$
 (iv) $7n + 20 \rightarrow 5^{\text{th}}: 55$;
 $10^{\text{th}}: 90$;
 $100^{\text{th}}: 720$
 (v) $n^2 + 1 \rightarrow 5^{\text{th}}: 26$;
 $10^{\text{th}}: 101$

EXERCISE 13.1

1. (i) 64 (ii) 729 (iii) 121 (iv) 625
 2. (i) 6^4 (ii) t^2 (iii) b^4 (iv) $5^2 \times 7^3$ (v) $2^2 \times a^2$ (vi) $a^3 \times c^4 \times d$
 3. (i) 2^9 (ii) 7^3 (iii) 3^6 (iv) 5^5
 4. (i) 3^4 (ii) 3^5 (iii) 2^8 (iv) 2^{100} (v) 2^{10}
 5. (i) $2^3 \times 3^4$ (ii) 5×3^4 (iii) $2^2 \times 3^3 \times 5$ (iv) $2^4 \times 3^2 \times 5^2$
 6. (i) 2000 (ii) 196 (iii) 40 (iv) 768 (v) 0
 (vi) 675 (vii) 144 (viii) 90000
 7. (i) -64 (ii) 24 (iii) 225 (iv) 8000
 8. (i) $2.7 \times 10^{12} > 1.5 \times 10^8$ (ii) $4 \times 10^{14} < 3 \times 10^{17}$

EXERCISE 13.2

1. (i) 3^{14} (ii) 6^5 (iii) a^5 (iv) 7^{x+2} (v) 5^3 (vi) $(10)^5$
 (vii) $(ab)^4$ (viii) 3^{12} (ix) 2^8 (x) 8^{t-2}
 2. (i) 3^3 (ii) 5^3 (iii) 5^5 (iv) 7×11^5 (v) 3^0 or 1 (vi) 3
 (vii) 1 (viii) 2 (ix) $(2a)^2$ (x) a^{10} (xi) a^3b (xii) 2^8

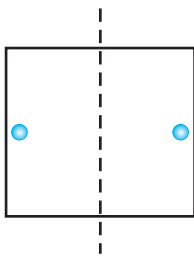
3. (i) False; $10 \times 10^{11} = 10^{12}$ and $(100)^{11} = 10^{22}$ (ii) False; $2^3 = 8, 5^2 = 25$
 (iii) False; $6^5 = 2^5 \times 3^5$ (iv) True; $3^0 = 1, (1000)^0 = 1$
4. (i) $2^8 \times 3^4$ (ii) $2 \times 3^3 \times 5$ (iii) $3^6 \times 2^6$ (iv) $2^8 \times 3$ 5. (i) 98 (ii) $\frac{5t^4}{8}$ (iii) 1

EXERCISE 13.3

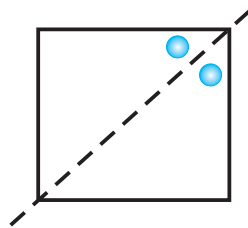
1. $279404 = 2 \times 10^5 + 7 \times 10^4 + 9 \times 10^3 + 4 \times 10^2 + 0 \times 10^1 + 4 \times 10^0$
 $3006194 = 3 \times 10^6 + 0 \times 10^5 + 0 \times 10^4 + 6 \times 10^3 + 1 \times 10^2 + 9 \times 10^1 + 4 \times 10^0$
 $2806196 = 2 \times 10^6 + 8 \times 10^5 + 0 \times 10^4 + 6 \times 10^3 + 1 \times 10^2 + 9 \times 10^1 + 6 \times 10^0$
 $120719 = 1 \times 10^5 + 2 \times 10^4 + 0 \times 10^3 + 7 \times 10^2 + 1 \times 10^1 + 9 \times 10^0$
 $20068 = 2 \times 10^4 + 0 \times 10^3 + 0 \times 10^2 + 6 \times 10^1 + 8 \times 10^0$
2. (a) 86045 (b) 405302 (c) 30705 (d) 900230
3. (i) 5×10^7 (ii) 7×10^6 (iii) 3.1865×10^9 (iv) 3.90878×10^5
 (v) 3.90878×10^4 (vi) 3.90878×10^3
4. (a) $3.84 \times 10^8 \text{ m}$ (b) $3 \times 10^8 \text{ m/s}$ (c) $1.2756 \times 10^7 \text{ m}$ (d) $1.4 \times 10^9 \text{ m}$
 (e) 1×10^{11} (f) $1.2 \times 10^{10} \text{ years}$ (g) $3 \times 10^{20} \text{ m}$ (h) 6.023×10^{22}
 (i) $1.353 \times 10^9 \text{ km}^3$ (j) 1.027×10^9

EXERCISE 14.1

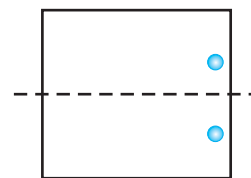
1.



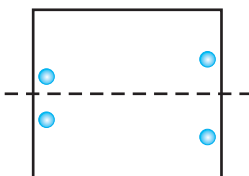
(a)



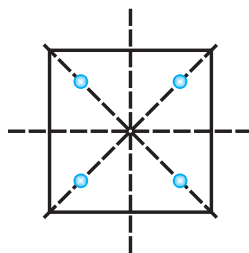
(b)



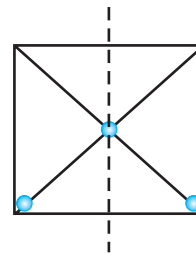
(c)



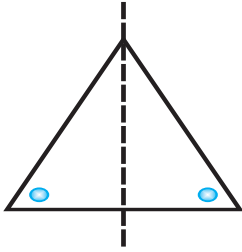
(d)



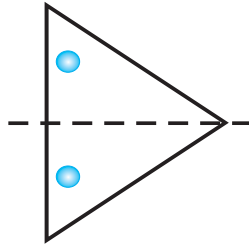
(e)



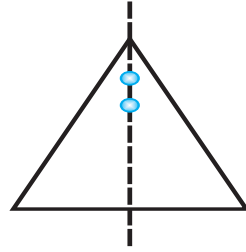
(f)



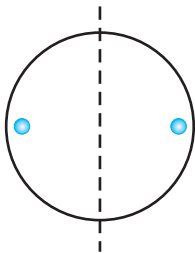
(g)



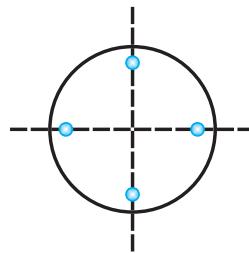
(h)



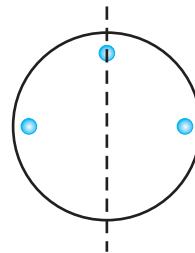
(i)



(j)

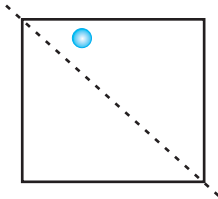


(k)

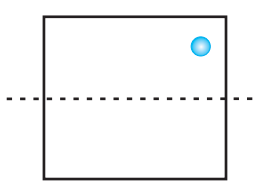


(l)

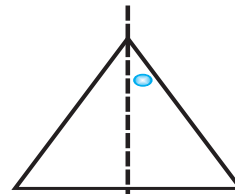
2.



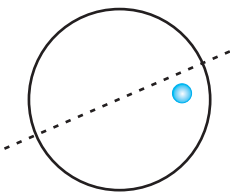
(a)



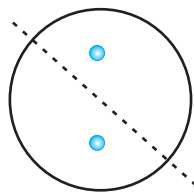
(b)



(c)

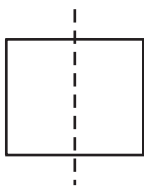


(d)

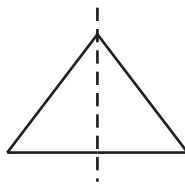


(e)

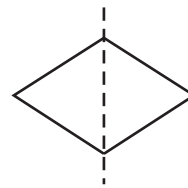
3.



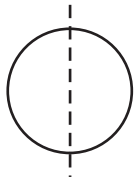
(a) Square



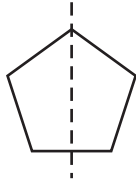
(b) Triangle



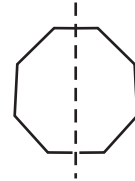
(c) Rhombus



(d) Circle

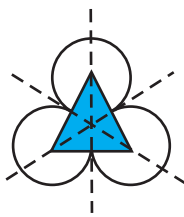


(e) Pentagon

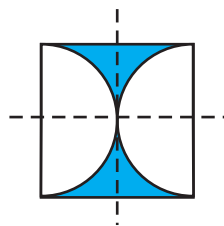


(f) Octagon

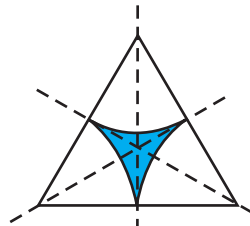
4.



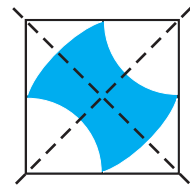
(a)



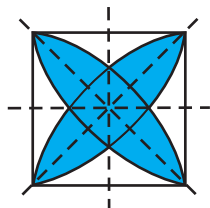
(b)



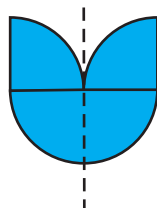
(c)



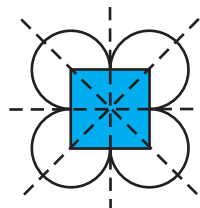
(d)



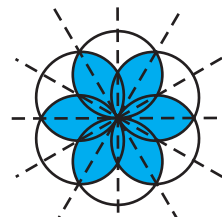
(e)



(f)



(g)



(h)

7. (a) 3 (b) 1 (c) 0 (d) 4 (e) 2 (f) 4
 (g) 0 (h) 0 (i) 6 (j) Infinitely many
8. (a) A, H, I, M, O, T, U, V, W, X, Y (b) B, C, D, E, H, I, O, X
 (c) O, X, I, H
10. (a) Median (b) Diameter

EXERCISE 14.2

1. (a), (b), (d), (e), (f)
 2. (a) 2 (b) 2 (c) 3 (d) 4 (e) 4 (f) 5
 (g) 6 (h) 3

EXERCISE 14.3

3. Yes 5. Square 6. $120^\circ, 180^\circ, 240^\circ, 300^\circ, 360^\circ$
 7. (i) Yes (ii) No

EXERCISE 15.1

1. Nets in (ii), (iii), (iv), (vi) form cubes.