

ANSWERS



EXERCISE 1.1

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

EXERCISE 1.2

1. (a) -3 (b) -225 (c) 630 (d) 316 (e) 0
 (f) 1320 (g) 162 (h) -360 (i) -24 (j) 36
3. (i) $-a$ (ii) (a) 22 (b) -37 (c) 0
4. $-1 \times 5 = -5, -1 \times 4 = -4 = -5 + 1, -1 \times 3 = -3 = -4 + 1,$
 $-1 \times 2 = -2 = -3 + 1, -1 \times 1 = -1 = -2 + 1, -1 \times 0 = 0 = -1 + 1$ so, $-1 \times (-1) = 0 + 1 = 1.$

EXERCISE 1.3

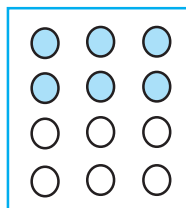
1. (a) -3 (b) -10 (c) 4 (d) -1
 (e) -13 (f) 0 (g) 1 (h) -1 (i) 1
3. (a) 1 (b) 75 (c) -206 (d) -1
 (e) -87 (f) -48 (g) -10 (h) -12
4. $(-6, 2), (-12, 4), (12, -4), (9, -3), (-9, 3)$ (There could be many such pairs)
5. 9 p.m.; -14°C 6. (i) 8 (ii) 13 7. 1 hour

EXERCISE 2.1

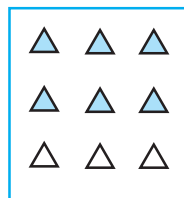
1. (i) (d) (ii) (b) (iii) (a) (iv) (c)
2. (i) (c) (ii) (a) (iii) (b)

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

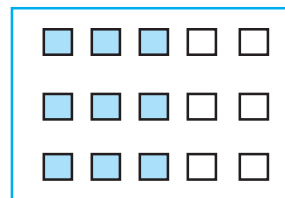
4. One way of doing this is:



(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 2.2

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) $1\frac{13}{35}$
 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 2.3

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 2.4

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 2.5

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		4
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 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) $\frac{z}{3} + 3 = 30$
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) $8x + 4 = 60; x = 7$ (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) $\frac{5n}{2} - 7 = 23; n = 12$
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) 90° (ii) 180° (iii) linear pair
 10. (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) $x = 100^\circ$
 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. Yes
 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) 12.5% (b) 125% (c) 7.5% (d) $28\frac{4}{7}\%$
 2. (a) 65% (b) 210% (c) 2% (d) 1235%
 3. (i) $\frac{1}{4}, 25\%$ (ii) $\frac{3}{5}; 60\%$ (iii) $\frac{3}{8}; 37.5\%$
 4. (a) 37.5 (b) $\frac{3}{5}$ minute or 36 seconds (c) ₹ 500
 (d) 0.75 kg or 750 g
 5. (a) 12000 (b) ₹ 9,000 (c) 1250 km (d) 20 minutes (e) 500 litres
 6. (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%
 8. 40%; 6000 9. ₹ 40,000 10. 5 matches

EXERCISE 7.2

1. (a) Profit = ₹ 75; Profit % = 30 (b) Profit = ₹ 1500; Profit % = 12.5
 (c) Profit = ₹ 500; Profit % = 20 (d) Loss = ₹ 100; Loss % = 40
 2. (a) 75%; 25% (b) 20%, 30%, 50% (c) 20%; 80% (d) 12.5%; 25%; 62.5%
 3. 2% 4. $5\frac{5}{7}\%$ 5. ₹ 12,000 6. ₹ 16,875
 7. (i) 12% (ii) 25 g 8. ₹ 233.75 9. (a) ₹ 1,632 (b) ₹ 8,625
 10. 0.25% 11. ₹ 500

EXERCISE 8.1

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) $\frac{-35}{45} \left(= \frac{-7}{9} \right), \frac{-34}{45}, \frac{-33}{45} \left(= \frac{-11}{15} \right), \frac{-32}{45}, \frac{-31}{45}$

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

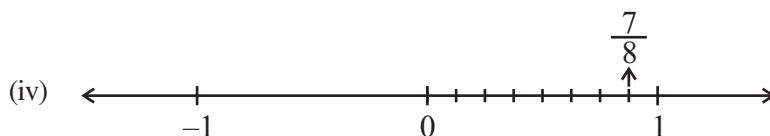
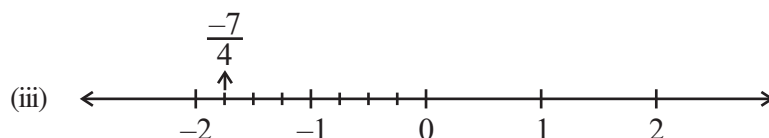
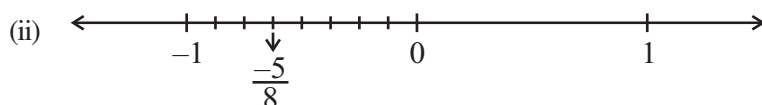
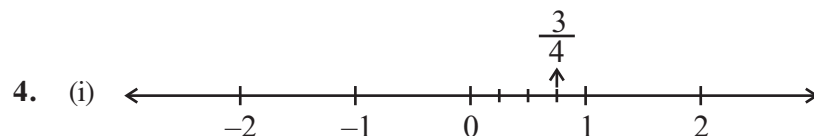
(iii) $\frac{5}{-30}, \frac{6}{-36}, \frac{7}{-42}, \frac{8}{-48}$

(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 8.2

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 9.1

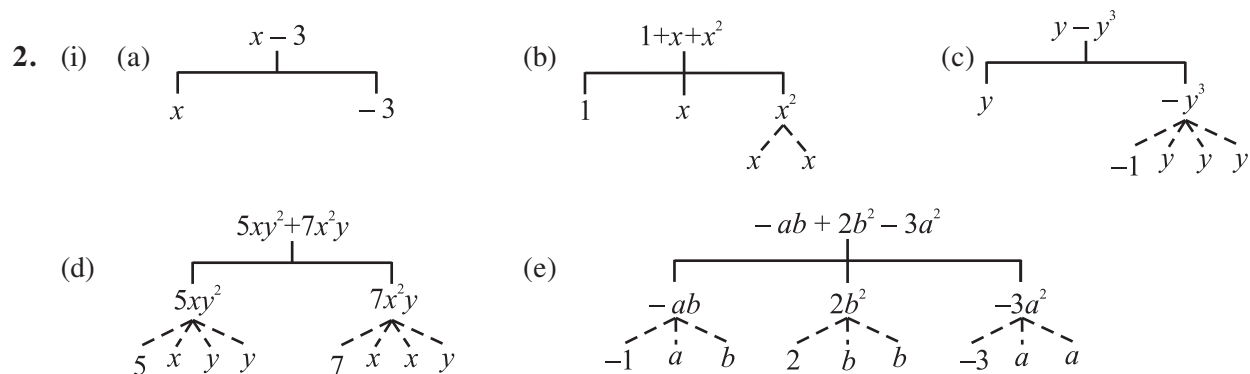
1. (a) 28 cm² (b) 15 cm² (c) 8.75 cm² (d) 24 cm² (e) 8.8 cm²
2. (a) 6 cm² (b) 8 cm² (c) 6 cm² (d) 3 cm²
3. (a) 12.3 cm (b) 10.3 cm (c) 5.8 cm (d) 1.05 cm
4. (a) 11.6 cm (b) 80 cm (c) 15.5 cm
5. (a) 91.2 cm² (b) 11.4 cm
6. length of BM = 30cm; length of DL = 42 cm
7. Area of $\triangle ABC = 30 \text{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

EXERCISE 9.2

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; ₹ 528 5. 21.98 cm²
6. 4.71 m; ₹ 70.65 7. 25.7 cm 8. ₹ 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 10.1

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)	$\frac{3}{4}x + \frac{1}{4}$	$\frac{3}{4}x$ $\frac{1}{4}$	$\frac{3}{4}, x$ $\frac{1}{4}$
(h)	$0.1p^2 + 0.2q^2$	$0.1p^2$ $0.2q^2$	$0.1, p, p$ $0.2, q, q$

3.

	Expression	Terms	Coefficients
(i)	$5 - 3t^2$	$-3t^2$	-3
(ii)	$1 + t + t^2 + t^3$	t	1
		t^2	1
		t^3	1
(iii)	$x + 2xy + 3y$	x	1
		$2xy$	2
		$3y$	3
(iv)	$100m + 1000n$	$100m$	100
		$1000n$	1000
(v)	$-p^2q^2 + 7pq$	$-p^2q^2$	-1
		$7pq$	7
(vi)	$1.2a + 0.8b$	$1.2a$	1.2
		$0.8b$	0.8
(vii)	$3.14r^2$	$3.14r^2$	3.14
(viii)	$2(l + b)$	$2l$	2
		$2b$	2
(ix)	$0.1y + 0.01y^2$	$0.1y$	0.1
		$0.01y^2$	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	1
		xy	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)	$2x^2y - 15xy^2 + 7y^2$	$-15xy^2$	$-15x$
		$7y^2$	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 10.2

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 11.1

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 11.2

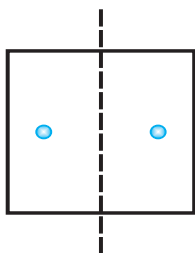
1. (i) 3^{14} (ii) 6^5 (iii) a^5 (iv) 7^{x+2} (v) 5^3 (vi) $(10)^5$
 (vii) $(ab)^4$ (viii) 3^{12} (ix) 2^8 (x) 8^{t-2}
2. (i) 3^3 (ii) 5^3 (iii) 5^5 (iv) 7×11^5 (v) 3^0 or 1 (vi) 3
 (vii) 1 (viii) 2 (ix) $(2a)^2$ (x) a^{10} (xi) a^3b (xii) 2^8
3. (i) False; $10 \times 10^{11} = 10^{12}$ and $(100)^{11} = 10^{22}$ (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 11.3

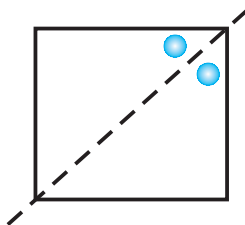
1. $279404 = 2 \times 10^5 + 7 \times 10^4 + 9 \times 10^3 + 4 \times 10^2 + 0 \times 10^1 + 4 \times 10^0$
 $3006194 = 3 \times 10^6 + 0 \times 10^5 + 0 \times 10^4 + 6 \times 10^3 + 1 \times 10^2 + 9 \times 10^1 + 4 \times 10^0$
 $2806196 = 2 \times 10^6 + 8 \times 10^5 + 0 \times 10^4 + 6 \times 10^3 + 1 \times 10^2 + 9 \times 10^1 + 6 \times 10^0$
 $120719 = 1 \times 10^5 + 2 \times 10^4 + 0 \times 10^3 + 7 \times 10^2 + 1 \times 10^1 + 9 \times 10^0$
 $20068 = 2 \times 10^4 + 0 \times 10^3 + 0 \times 10^2 + 6 \times 10^1 + 8 \times 10^0$
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 12.1

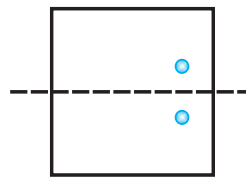
1.



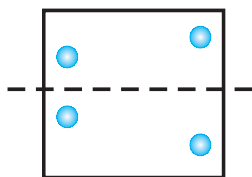
(a)



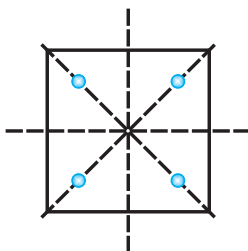
(b)



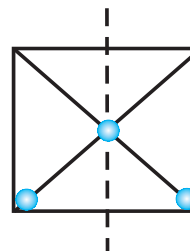
(c)



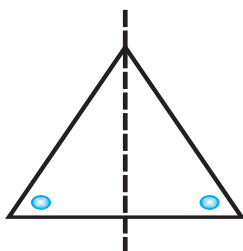
(d)



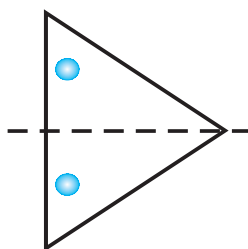
(e)



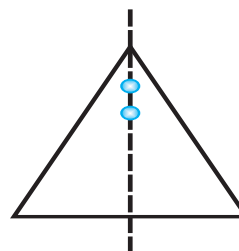
(f)



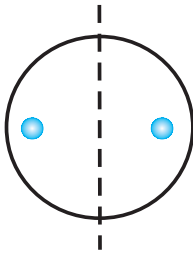
(g)



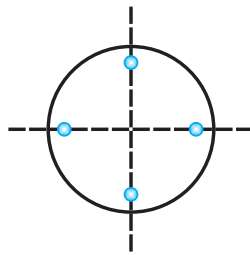
(h)



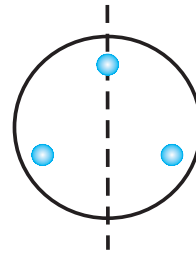
(i)



(j)

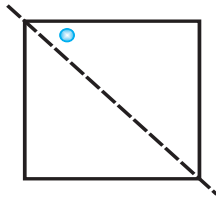


(k)

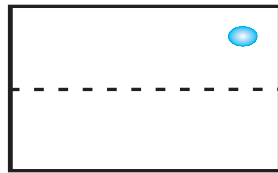


(l)

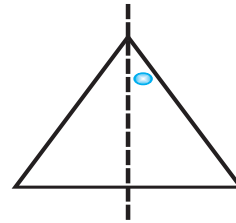
2.



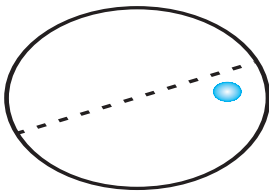
(a)



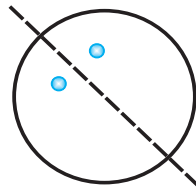
(b)



(c)

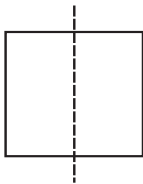


(d)

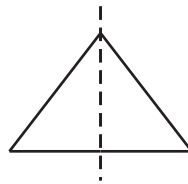


(e)

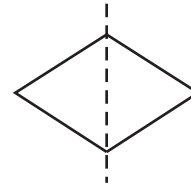
3.



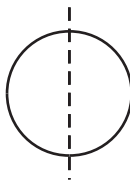
(a) Square



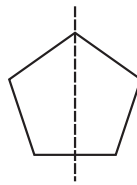
(b) Triangle



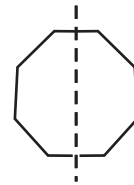
(c) Rhombus



(d) Circle

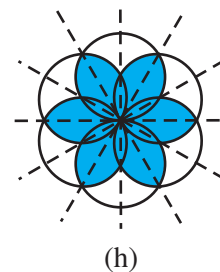
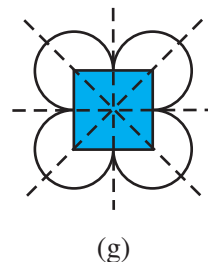
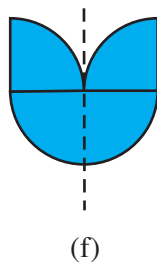
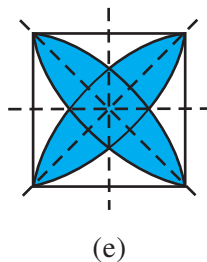
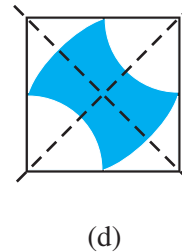
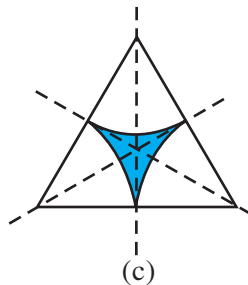
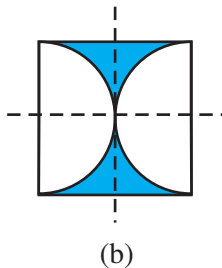
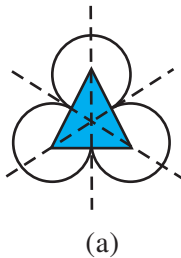


(e) Pentagon



(f) Octagon

4.



7. (a) 3 (b) 1 (c) 0 (d) 4 (e) 2 (f) 2
 (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 12.2

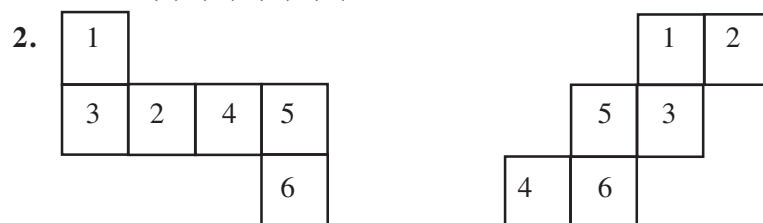
1. (a), (b), (d), (e), (f)
 2. (a) 2 (b) 2 (c) 3 (d) 4 (e) 4 (f) 5
 (g) 6 (h) 3

EXERCISE 12.3

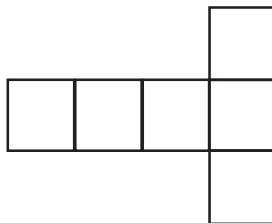
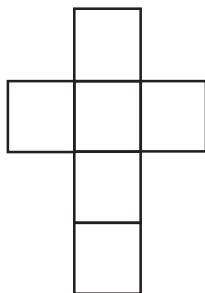
3. Yes 5. Square 6. $120^\circ, 180^\circ, 240^\circ, 300^\circ, 360^\circ$
 7. (i) Yes (ii) No

EXERCISE 13.1

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



3. No, because one pair of opposite faces will have 1 and 4 on them whose total is not 7, and another pair of opposite faces will have 3 and 6 on them whose total is also not 7.
4. Three faces



5. (a) (ii) (b) (iii) (c) (iv) (d) (i)

BRAIN-TEASERS

1. Solve the number riddles:

- (i) Tell me who I am! Who I am!
 Take away from me the number eight,
 Divide further by a dozen to come up with
 A full team for a game of cricket!
- (ii) Add four to six times a number,
 To get exactly sixty four!
 Perfect credit is yours to ask for
 If you instantly tell the score!



2. Solve the teasers:

- (i) There was in the forest an old Peepal tree
 The grand tree had branches ten and three
 On each branch there lived birds fourteen
 Sparrows brown, crows black and parrots green!
 Twice as many as the parrots were the crows
 And twice as many as the crows were the sparrows!
 We wonder how many birds of each kind
 Aren't you going to help us find?
- (ii) I have some five-rupee coins and some two-rupee coins. The number of two-rupee coins is twice the number of five-rupee coins. The total money I have is 108 rupees. So how many five-rupee coins do I have? And how many two-rupee coins?
3. I have 2 vats each containing 2 mats. 2 cats sat on each of the mats. Each cat wore 2 funny old hats. On each hat lay 2 thin rats. On each rat perched 2 black bats. How many things are in my vats?

4. Twenty-seven small cubes are glued together to make a big cube. The exterior of the big cube is painted yellow in colour. How many among each of the 27 small cubes would have been painted yellow on
 - (i) only one of its faces?
 - (ii) two of its faces?
 - (iii) three of its faces?
5. Rahul wanted to find the height of a tree in his garden. He checked the ratio of his height to his shadow's length. It was 4:1. He then measured the shadow of the tree. It was 15 feet. So what was the height of the tree?
6. A woodcutter took 12 minutes to make 3 pieces of a block of wood. How much time would be needed to make 5 such pieces?
7. A cloth shrinks 0.5% when washed. What fraction is this?
8. Smita's mother is 34 years old. Two years from now mother's age will be 4 times Smita's present age. What is Smita's present age?
9. Maya, Madhura and Mohsina are friends studying in the same class. In a class test in geography, Maya got 16 out of 25. Madhura got 20. Their average score was 19. How much did Mohsina score?

Answers

1. (i) 140 (ii) 10
2. (i) Sparrows: 104, crows: 52, Parrots: 26
(ii) Number of ₹ 5 coins = 12, Number of ₹ 2 coins = 24
3. 124 4. (i) 6 (ii) 10 (iii) 8 5. 60 feet
6. 24 minutes 7. $\frac{1}{200}$ 8. 7 years 9. 21