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

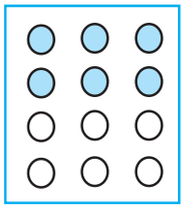
1. (i) (d) (ii) (b) (iii) (a) (iv) (c)

2. (i) (c) (ii) (a) (iii) (b)

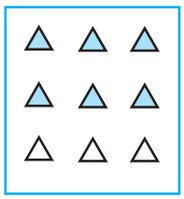
3. (i) $4\frac{1}{5}$ (ii) $1\frac{1}{3}$ (iii) $1\frac{5}{7}$ (iv) $1\frac{1}{9}$ (v) $2\frac{2}{3}$

(vi) 15 (vii) $6\frac{2}{7}$ (viii) 16 (ix) $4\frac{1}{3}$ (x) 9

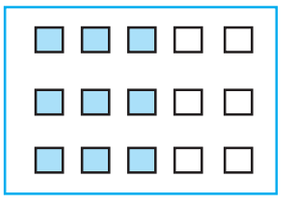
4. One way of doing this is:



(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 cm^2

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	I	1
2	II	2
3	I	1
4	III	3
5	𝍸	5
6	IIII	4
7	II	2
8	I	1
9	I	1

(i) 9 (ii) 1 (iii) 8 (iv) 5

3. 2 **4.** 50

5. (i) 12.5 (ii) 3, player C had played only 3 games (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 mm (ii) 5.9 mm (iii) 5 days **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) $4b = 180°$

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; $y = \frac{36}{8}\left(\text{or} = \frac{9}{2}\right)$ (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
Step 2: Divide both sides by 3; $n = 16$
(b) Step 1: Subtract 7 from both sides
Step 2: Divide both sides by 5; $m = 2$
(c) Step 1: Multiply both sides by 3
Step 2: Divide both sides by 20; $p = 6$
(d) Step 1: Multiply both sides 10
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) angles of linear pair

10. (i) ∠AOD, ∠BOC (ii) ∠EOA, ∠AOB (iii) ∠EOB, ∠EOD
(iv) ∠EOA, ∠EOC, etc. (v) ∠AOB, ∠AOE; ∠AOE, ∠EOD; ∠EOD, ∠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) ∠1, ∠5; ∠2, ∠6; ∠3, ∠7; ∠4, ∠8 (ii) ∠2, ∠8; ∠3, ∠5
(iii) ∠2, ∠5; ∠3, ∠8 (iv) ∠1, ∠3; ∠2, ∠4; ∠5, ∠7; ∠6, ∠8

3. $a = 55°$; $b = 125°$; $c = 55°$; $d = 125°$; $e = 55°$; $f = 55°$

4. (i) $x = 70°$ (ii) $x = 100°$

5. (i) ∠DGC = 70° (ii) ∠DEF = 70°

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) $x = 70°, y = 60°$ (ii) $x = 50°, y = 80°$ (iii) $x = 110°, y = 70°$
(iv) $x = 60°, y = 90°$ (v) $x = 45°, y = 90°$ (vi) $x = 60°, y = 60°$

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

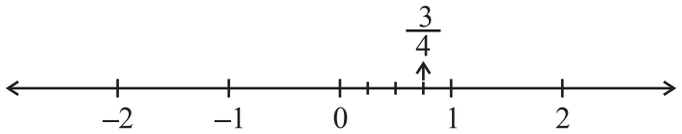
1. (i) $\frac{-2}{3}, \frac{-1}{2}, \frac{-2}{5}, \frac{-1}{3}, \frac{-2}{7}$ (ii) $\frac{-3}{2}, \frac{-5}{3}, \frac{-8}{5}, \frac{-10}{7}, \frac{-9}{5}$

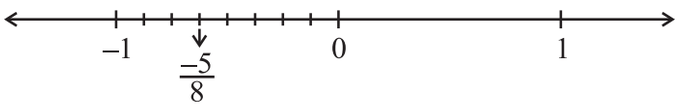
(iii) $\frac{-35}{45}\left(=\frac{-7}{9}\right), \frac{-34}{45}, \frac{-33}{45}\left(=\frac{-11}{15}\right), \frac{-32}{45}, \frac{-31}{45}$ (iv) $\frac{-1}{3}, \frac{-1}{4}, 0, \frac{1}{3}, \frac{1}{2}$

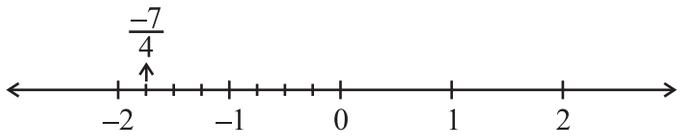
2. (i) $\frac{-15}{25}, \frac{-18}{30}, \frac{-21}{35}, \frac{-24}{40}$ (ii) $\frac{-4}{16}, \frac{-5}{20}, \frac{-6}{24}, \frac{-7}{28}$

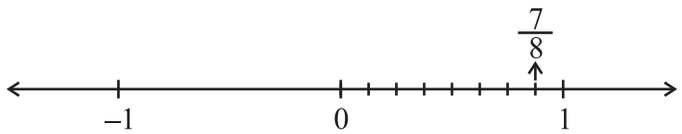
(iii) $\frac{5}{-30}, \frac{6}{-36}, \frac{7}{-42}, \frac{8}{-48}$ (iv) $\frac{8}{-12}, \frac{10}{-15}, \frac{12}{-18}, \frac{14}{-21}$

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

4. (i) 

(ii) 

(iii) 

(iv) 

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

6. (ii), (iii), (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 cm^2 (b) 15 cm^2 (c) 8.75 cm^2 (d) 24 cm^2 (e) 8.8 cm^2

2. (a) 6 cm^2 (b) 8 cm^2 (c) 6 cm^2 (d) 3 cm^2

3. (a) 12.3 cm (b) 10.3 cm (c) 5.8 cm (d) 1.05 cm

4. (a) 11.6 cm (b) 80 mm (c) 15.5 cm

5. (a) 91.2 cm^2 (b) 11.4 cm

6. length of BM = 30cm; length of DL = 42 cm

7. Area of ΔABC = 30 cm^2; length of AD = $\frac{60}{13}$ cm

8. Area of ΔABC = 27 cm^2; length of CE = 7.2 cm

Exercise 9.2

1. (a) 88 cm (b) 176 mm (c) 132 cm

2. (a) 616 mm^2 (b) 1886.5 m^2 (c) $\frac{550}{7}$ cm^2

3. 24.5 m; 1886.5 m^2 **4.** 132 m; ₹ 528 **5.** 21.98 cm^2

6. 4.71 m; ₹ 70.65 **7.** 25.7 cm **8.** ₹ 30.14 (approx.) **9.** 7 cm; 154 cm^2; 11cm; circle.

10. 536 cm^2 **11.** 23.44 cm^2 **12.** 5 cm; 78.5 cm^2 **13.** 879.20 m^2

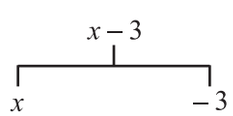
14. Yes **15.** 119.32 m; 56.52m **16.** 200 Times **17.** 94.2 cm

Exercise 10.1

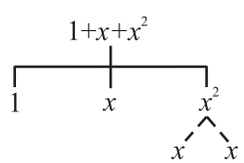
1. (i) $y - z$ (ii) $\frac{1}{2}(x + y)$ (iii) z^2 (iv) $\frac{1}{4}pq$ (v) $x^2 + y^2$ (vi) $5 + 3mn$

(vii) $10 - yz$ (viii) ab – (a + b)

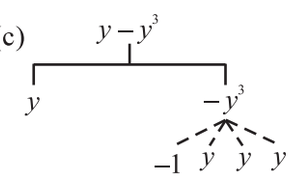
2. (i) (a)



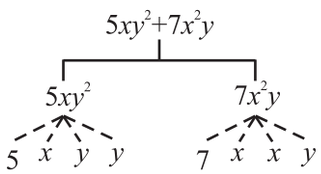
(b)



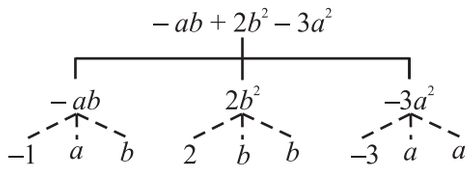
(c)



(d)



(e)



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

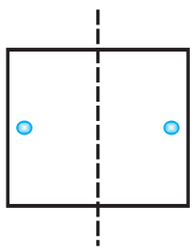
2. (a) 86045 (b) 405302 (c) 30705 (d) 900230

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

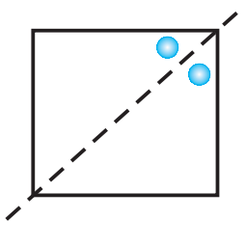
4. (a) 3.84×10^8m (b) 3×10^8 m/s (c) 1.2756×10^7m (d) 1.4×10^9 m
(e) 1×10^{11} stars (f) 1.2×10^{10} years (g) 3×10^{20} m (h) 6.023×10^{22} molecules
(i) 1.353×10^9 km^3 (j) 1.027×10^9 people

EXERCISE 12.1

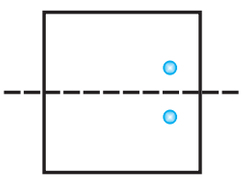
1.



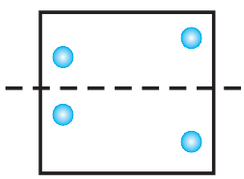
(a)



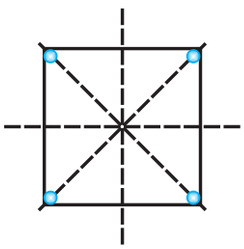
(b)



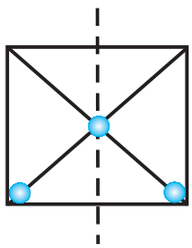
(c)



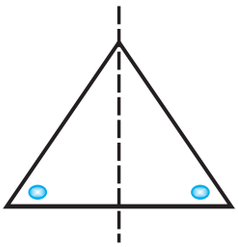
(d)



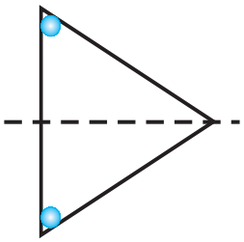
(e)



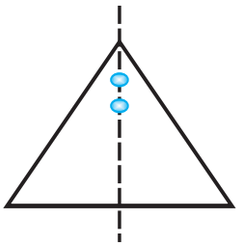
(f)



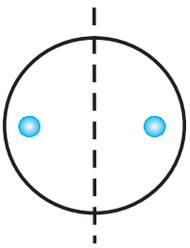
(g)



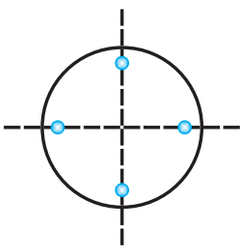
(h)



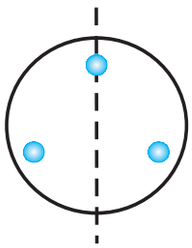
(i)



(j)

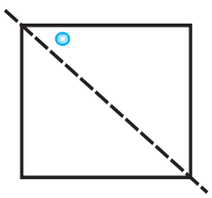


(k)

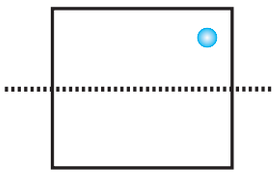


(l)

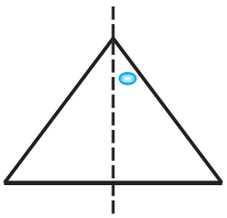
2.



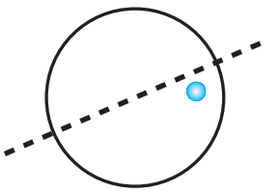
(a)



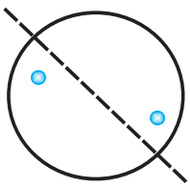
(b)



(c)

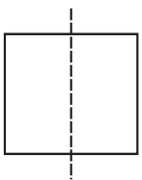


(d)

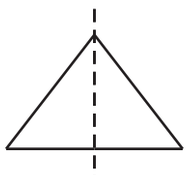


(e)

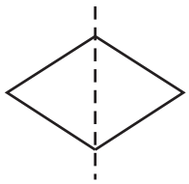
3.



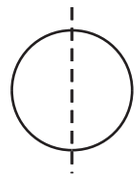
(a) Square



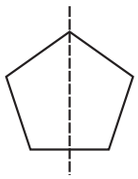
(b) Triangle



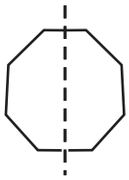
(c) Rhombus



(d) Circle

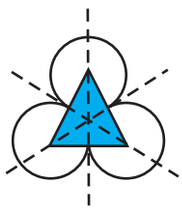


(e) Pentagon

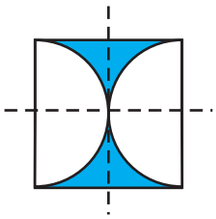


(f) Octagon

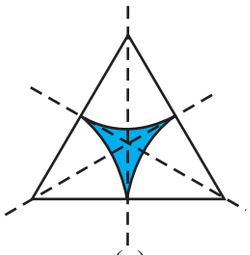
4.



(a)

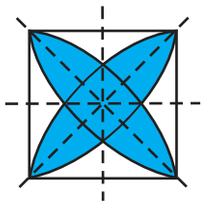


(b)

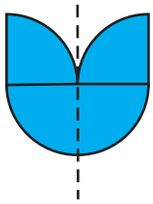


(c)

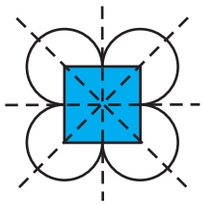
(d)



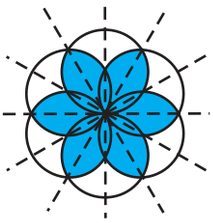
(e)



(f)



(g)



(h)

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, K
(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

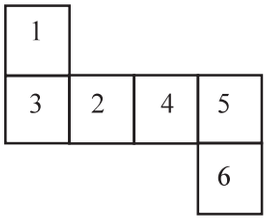
3. Yes **5.** Square **6.** 120°, 180°, 240°, 300°, 360°

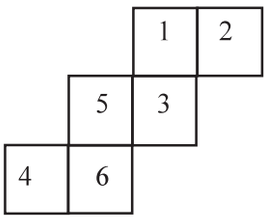
7. (i) Yes (ii) No

Exercise 13.1

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

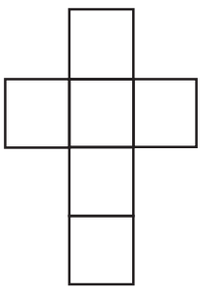
2.

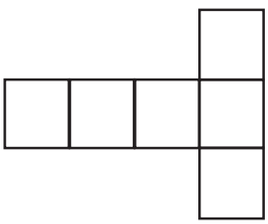




3. No, because one pair of opposite faces will have 1 and 4 on them whose total is not 7, and another pair of opposite faces will have 3 and 6 on them whose total is also not 7.

4. Three faces





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