

Key book

Understanding Mathematics

8



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Exercise I.1

1. (a) False (b) True (c) True (d) False
2. (a) Negative (b) Positive (c) Positive
(d) Positive (e) Negative
3. (a) $\frac{31}{-4}$ (b) 4 (c) $\frac{12}{5}$
(d) $\frac{25}{14}$ (e) $\frac{4}{9}$
4. (a) $\frac{14}{24}, \frac{21}{36}, \frac{28}{48}$ (b) $\frac{-6}{14}, \frac{-9}{21}, \frac{-12}{28}$ (c) $\frac{20}{14}, \frac{30}{21}, \frac{40}{28}$
(d) $\frac{22}{30}, \frac{33}{45}, \frac{44}{60}$ (e) $\frac{2}{-3}, \frac{12}{-18}, \frac{24}{-36}$
5. (a) $\frac{14}{-63} = \frac{\boxed{-2}}{9} = \frac{-18}{\boxed{81}}$ (b) $\frac{-5}{-12} = \frac{\boxed{25}}{60} = \frac{-35}{\boxed{-84}}$
(c) $\frac{8}{21} = \frac{32}{84} = \frac{64}{168}$
6. (a) $\frac{12}{5} > \frac{15}{8}$ (b) $\frac{-3}{4} < \frac{5}{-6}$ (c) $\frac{9}{14} < \frac{5}{7}$
7. (a) $\frac{-11}{20} < \frac{7}{-15} < \frac{3}{10} < \frac{57}{30}$ (b) $\frac{-2}{3} < \frac{1}{2} < \frac{4}{7} < \frac{4}{5}$
(c) $\frac{-5}{10} < \frac{3}{5} < \frac{7}{10}$
8. (a) $\frac{8}{9} > \frac{10}{12} > \frac{4}{7}$ (b) $\frac{11}{12} > \frac{8}{9} > \frac{2}{3} > \frac{-3}{4}$
(c) $\frac{5}{12} > \frac{3}{8} > \frac{-2}{9}$

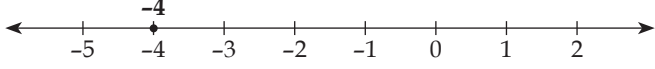
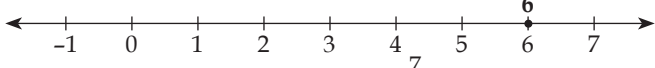
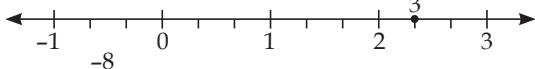
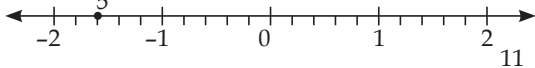
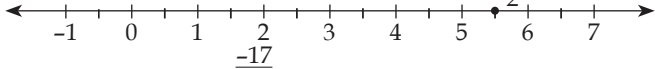
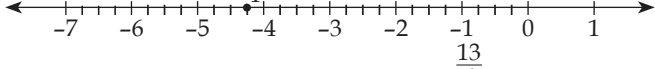
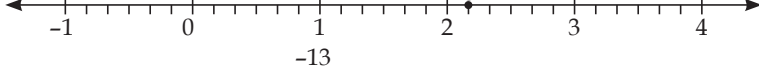
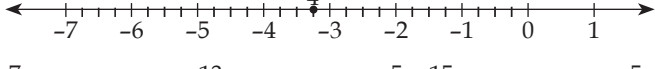
Exercise I.2

1. (a) True (b) True (c) False (d) False
2. (a) $\frac{7}{9}$ (b) $\frac{13}{7}, \frac{6}{11}$ (c) $\frac{2}{5}$ (d) 6
7. (a) $\frac{-97}{40}$ (b) $\frac{-4}{11}$ (c) $\frac{233}{140}$ (d) $\frac{4}{3}$
(e) $\frac{-113}{24}$ (f) $\frac{199}{30}$
8. (a) $\frac{-39}{56}$ 10. $\frac{-3}{4}$

Exercise I.3

1. (a) False (b) False (c) True (d) False
(e) True (f) False
4. (a) $\frac{-1}{3}$ (b) $\frac{-11}{45}$ (c) $\frac{1}{7}$ (d) $\frac{-13}{18}$
5. (a) $\frac{8}{3}$ (b) $\frac{-25}{3}$ (c) $\frac{-56}{3}$ (d) $\frac{64}{27}$
6. $\frac{-31}{36}$ 7. $\frac{360}{119}$ 8. $\frac{-9}{20}$
9. $\frac{-9}{8}$ 10. $\frac{527}{224}$ 11. $\frac{67}{120}$

Exercise 1.4

1. (a)  (b)  (c)  (d)  (e)  (f)  (g)  (h) 
2. (a) $\frac{7}{4}$ (b) $\frac{-13}{5}$ (c) $\frac{-5}{6}, \frac{15}{6}$ (d) $-3, \frac{-5}{3}, \frac{1}{3}, \frac{11}{3}$
3. (a) $\frac{21}{10}, \frac{22}{10}, \frac{23}{10}$ (b) $\frac{71}{40}, \frac{72}{40}, \frac{73}{40}$ (c) $\frac{-2}{16}, \frac{-1}{16}, \frac{1}{16}$
4. (a) $\frac{151}{100}, \frac{152}{100}, \frac{153}{100}, \frac{154}{100}, \frac{155}{100}, \frac{156}{100}$ (b) $\frac{91}{120}, \frac{92}{120}, \frac{93}{120}, \frac{94}{120}, \frac{95}{120}, \frac{96}{120}$
(c) $\frac{-11}{15}, \frac{-10}{15}, \frac{-9}{15}, \frac{-8}{15}, \frac{-7}{15}, \frac{-6}{15}$
5. (a) $\frac{61}{160}, \frac{31}{80}, \frac{63}{160}$ (b) $\frac{-23}{40}, \frac{-19}{60}, \frac{-7}{120}$
(c) $\frac{-39}{60}, \frac{-19}{30}, \frac{-37}{60}$

Exercise 1.5

1. 1000, 350 by bus, 375 by bicycle
2. $56\frac{1}{3}m$ 3. 270 4. $2\frac{19}{40}kg$ 5. ₹123, 750
6. $\frac{29}{20}cm$ 7. 12 days 8. 560 9. $\frac{21}{36}$

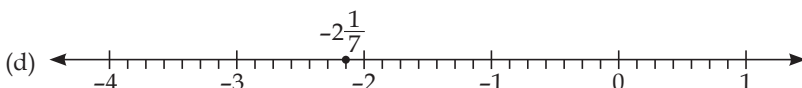
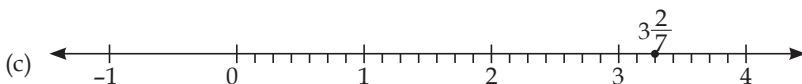
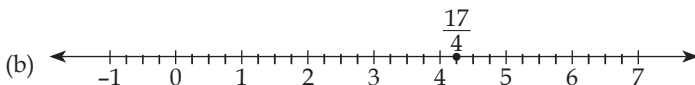
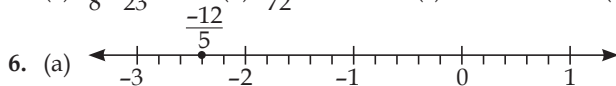
MCQ - I

1. 1 2. $\frac{12}{-5}$ 3. -6 4. $\frac{-8}{3}$
5. $\frac{7}{25}$ 6. $\frac{53}{24}$ 7. none of these 8. $161\frac{7}{10}$
9. Sum 10. $\frac{54}{67}$

Revision Exercise

1. (a) False (b) False (c) False (d) False

2. (a) $\frac{13}{8}, \frac{5}{23}$ (b) $\frac{29}{72}$ (c) Closure (d) 1



7. $\frac{161}{240}, \frac{162}{240}, \frac{163}{240}, \frac{164}{240}, \frac{165}{240}, \frac{166}{240}, \frac{167}{240}, \frac{168}{240}, \frac{169}{240}, \frac{170}{240}$

8. (a) $\frac{-67}{252}, \frac{-13}{126}, \frac{15}{252}, \frac{71}{504}$ (b) $\frac{27}{80}, \frac{17}{40}, \frac{41}{80}, \frac{89}{160}$

- (c) $\frac{-103}{96}, \frac{-47}{48}, \frac{-19}{24}, \frac{-29}{48}$

9. (a) 0 (b) $\frac{-137}{150}$ (c) $\frac{55}{14}$

10. $\frac{-115}{36}$ 11. $\frac{7}{8}$ 12. 198

13. $\frac{34}{77}$ 14. 1240 km 15. 88 ml

Chapter 2

Exponents and Powers

Exercise 2.1

1. (a) $(-2)^5$ (b) $\left(\frac{3}{7}\right)^4$ (c) $\left(\frac{-2}{11}\right)^6$ (d) $\left(\frac{13}{6}\right)^5$

2. (a) Base = $\frac{-23}{56}$, Power = 6 (b) Base = $\frac{17}{19}$, Power = -5

- (c) Base = -6, Power = 0 (d) Base = $\frac{21}{5}$, Power = 4

3. (a) $\left(\frac{3}{11}\right)^4$ (b) $\left(\frac{1}{7}\right)^3$ (c) $\left(\frac{7}{3}\right)^{14}$ (d) $\left(\frac{-15}{-2}\right)^8$

4. (a) $\left(\frac{11}{9}\right)^4$ (b) $\left(\frac{-1}{4}\right)^6$ (c) $\left(\frac{11}{7}\right)^3$ (d) $\left(\frac{4}{-13}\right)^{18}$

5. (a) $\frac{-27}{8}$ (b) $\frac{6561}{16}$ (c) 1 (d) 16807

6. (a) $\frac{256}{625}$ (b) 14641 (c) $\frac{2187}{823543}$ (d) $\frac{64}{729}$

7. (a) 1296 (b) $\frac{4121}{648}$ (c) $\frac{64}{27}$ (d) $\frac{162}{35}$

Exercise 2.2

1. (a) $\frac{4}{9}$ (b) $\frac{16}{81}$ (c) $\frac{729}{4096}$ (d) 1
(e) $\frac{27}{16}$ (f) $\frac{-27}{125}$ (g) $\frac{27}{125}$ (h) $\frac{81}{256}$
(i) $\frac{49}{400}$
2. (a) 312 (b) $\frac{1}{4096}$ (c) $\frac{16}{729}$
3. $\frac{-1331}{125}$ 4. $\frac{32}{243}$ 5. -7 6. 4
7. -6 8. 0 9. $\frac{-8}{343}$
10. (a) $\frac{9}{8}$ (b) $\frac{1}{72}$ (c) $\frac{-9}{8}$
11. $\left(\frac{1}{3}\right)^{26}$ 12. $(16)^{12}$
13. (a) $\frac{3}{800}$ (b) 1 (c) 1728

Exercise 2.3

1. (a) 6.78×10^{-7} (b) 4.89×10^{-13} (c) 2.34×10^{22} (d) 7.82345×10^5
2. (a) .0000467 (b) 51206.84 (c) 0.00000009456
(d) 6200000
3. (a) $5.90 \times 10^{-8} m$ (b) $5.972 \times 10^{24} kg$
(c) $3.844 \times 10^8 m$ (d) $1.67 \times 10^{-24} g$
4. (a) 36.1×10^4 (b) $.000000498 \times 10^4$
5. (a) $3.5 \times 10^4 > 6.7 \times 10^3$
(b) $2.567 \times 10^{-4} > 3.54 \times 10^{-6}$
6. $\frac{1}{20}$ times (approx) 7. 15000 : 1
8. (a) 3.3607×10^5 (b) 6.23256×10^{-3}
(c) 8.48865×10^8
9. (a) 8.44655×10^7 (b) 8.5039×10^{-4}
(c) 7.72758×10^7

MCQ - II

1. 6.91×10^{-12} 2. 5.8609×10^8 3. 7 4. 0.0000989
5. 1 6. $\frac{1}{50625}$ 7. -1 8. 0
9. 1 10. 27

Revision Exercise

1. (a) False (b) True (c) True (d) True
2. (a) 6^4 (b) 7 (c) $\left(\frac{3}{5}\right)^6$ (d) .00018956
3. (a) Base = $\frac{-17}{6}$, Power = -4 (b) Base = -13, Power = 6
(c) Base = $\frac{45}{32}$, Power = -3 (d) Base = 8, Power = -15

- Chapter 3 Squares and Square Roots

- | | | | |
|--------------------------|-----------------------|----------------------|----------------|
| 3. (a) Yes | (b) No | (c) No | (d) Yes |
| 4. (a) 6, 8, 10 | (b) 5, 12, 13 | (c) 14, 48, 50 | (d) 28, 45, 53 |
| (e) 6, 8, 10 | (f) 16, 30, 34 | | |
| 5. (a) Yes | (b) No | (c) Yes | (d) No |
| 6. (a) $\frac{144}{289}$ | (b) $\frac{529}{225}$ | (c) $\frac{121}{49}$ | (d) 99.6004 |
| (e) 31.36 | (f) 99.6004 | | |

Exercise 3.3

- | | | | |
|----------------|-----------|------------------|------------|
| 1. (a) 8 | (b) 10 | (c) 12 | (d) 9 |
| 2. (a) 27 | (b) 42 | (c) 64 | (d) 84 |
| (e) 90 | (f) 252 | (g) 216 | (h) 165 |
| (i) 495 | (j) 850 | | |
| 3. (a) 3, 21 | (b) 2, 54 | (3) 2, 98 | (d) 7, 140 |
| 4. (a) 7, 6 | (b) 5, 18 | (c) 6, 66 | (d) 7, 20 |
| 5. (a) 24 | (b) 67 | (c) 76 | (d) 73 |
| (e) 89 | (f) 57 | (g) 83 | (h) 145 |
| (i) 4032 | (j) 746 | | |
| 6. 100489, 317 | | 7. 9998244, 3162 | |
| 8. 24, 68 | | 9. 31, 63 | |
| 10. (a) 5476 | (b) 5625 | | |

Exercise 3.4

- | | | | |
|-------------|----------|----------|----------|
| 1. (a) 12.5 | (b) 0.85 | (c) 10.4 | (d) 21.2 |
| 2. (a) 1.5 | (b) 0.3 | (c) 6.5 | (d) 7.2 |
| 3. (a) 45 | (b) 36 | (c) 31 | (d) 105 |
| 4. 5.6 cm | | | |

Exercise 3.5

- | | | | |
|----------|-----------------------|--------|-------------|
| 1. 77 | 2. 182 | 3. 49 | 4. 24 |
| 5. 2.1 m | 6. $20\frac{1}{10} m$ | 7. 9.9 | 8. 5929, 77 |
| 9. 8 cm | | | |

MCQ-III

- | | | | |
|----------|----------------------|-----------|---------------|
| 1. 256 | 2. $\frac{169}{289}$ | 3. 409600 | 4. 8189 |
| 5. 6 | 6. 53 | 7. 2 | 8. 16, 63, 65 |
| 9. 24.53 | 10. 52 | | |

Revision Exercise

- | | | | |
|------------------|----------|----------------------|-----------------------|
| 1. (a) 529 | (b) 2116 | (c) $\frac{289}{16}$ | (d) $\frac{121}{256}$ |
| 2. 6, 21, 45, 89 | | | |
| 3. (a) 729 | (b) 1849 | (c) 11881 | (d) 9409 |

4. (a) 5625 (b) 2401 (c) 13225 (d) 4761
 5. (a) 16 (b) 32 (c) 9 (d) 12
 6. (a) 36 (b) 98 (c) 216 (d) 72
 7. (a) 124 (b) 321 (c) 4.01 (d) 67
 8. 10004569 9. 99980001 10. 100, 80 11. 9, 97
 12. 12.5 cm 13. 1225 cm^2 , 35 cm
 14. 5929, 71, 77 15. 4800

Chapter 4

Cubes and Cube Roots

Exercise 4.1

1. (a) True (b) True (c) False (d) False
 2. (a) 357911 (b) 274.625 (c) $\frac{1331}{343}$ (d) -857375
 (e) $\frac{-3375}{512}$
 3. (a) 1728 (b) 6859 (c) 125000
 4. (a) 9 (b) 3 (c) 1 (d) 4
 (e) 2 (f) 6 (g) 8 (h) 3
 (i) 4 (j) 5
 5. (a) 10 (b) 2178 (c) 2 (d) 7 (e) 6
 6. (a) 25 (b) 11 (c) 44 (d) 49 (e) 2
 7. (a) $1^3 + 2^3 + 3^3 + 4^3 = (1 + 2 + 3 + 4)^2 = (10)^2 = 100$
 (b) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 = (1 + 2 + 3 + 4 + 5)^2 = (15)^2 = 225$
 (c) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 = (1 + 2 + 3 + 4 + 5 + 6)^2 = (21)^2 = 441$
 (d) $1^3 + 2^3 + 3^3 + \dots + 10^3 = (1 + 2 + 3 + \dots + 10)^2 = (55)^2 = 3025$

Exercise 4.2

1. (a) 24 (b) -16 (c) 18 (d) -60
 2. 6, 12 3. 6, 45 4. 6, 21952, 28
 5. 21, 74088, 42
 6. (a) $\frac{12}{7}$ (b) $\frac{-6}{13}$ (c) $\frac{5}{11}$ (d) $\frac{-9}{24}$
 7. (a) 0.8 (b) -2.5 (c) 0.09 (d) -1.6
 8. 6, 2.4

Exercise 4.3

1. (a) 42 (b) 20 (c) -9 (d) 12
 2. (a) 24 (b) 69 (c) -18 (d) 65
 3. 5.5 cm 4. 11390.625 cm^3 5. 238.14 cm^2 6. ₹95331.20
 7. 66 cm 8. 200 9. 64

MCQ-IV

- | | | | |
|-------------|-----------------------|---------|--------|
| 1. -1560896 | 2. $\frac{1728}{343}$ | 3. 4913 | 4. 18 |
| 5. 42 | 6. 2 | 7. -2.4 | 8. -12 |
| 9. 2.7 cm | 10. 7 | | |

Revision Exercise

- | | | | |
|------------------------|---------------|-----------------|-----------|
| 1. (a) True | (b) False | (c) True | (d) False |
| (e) True | | | |
| 2. (a) 50653 | (b) 10077.696 | (c) -134.217728 | |
| (d) $\frac{729}{2744}$ | (e) 941192 | | |
| 3. 1000030000300001 | | | |
| 1000001 | | | |
| 4. (a) 18 | (b) 14 | (c) 20 | (d) 22 |
| (e) 25 | (f) 28 | (g) 30 | (h) 35 |
| (i) 40 | (j) 100 | | |
| 5. (a) 7 | (b) 15 | (c) 17 | |
| (d) 43 | (e) 97 | | |
| 6. (a) 0.12 | (b) 0.1 | (c) 0.15 | |
| (d) 16.6 | (e) -5.4 | | |
| 7. 2, 20 | 8. 2, 16 | 9. 48 cm | |
| 10. 20 | 11. 6, 168 | 12. 18, 288 | |

Chapter 5

Playing with Numbers

Exercise 5.1

- | | |
|------------------------------------|-------------------------------------|
| 1. (a) Divisible by 2 and 3 | (b) Divisible by 2, 5 and 10 |
| (c) Divisible by 3 and 5 | (d) Divisible by 2, 3, 5 and 10 |
| (e) Not divisible by 2, 3, 5 or 10 | |
| 2. (a) Divisible by 3 and 6 | (b) Divisible by none of 3, 6, or 9 |
| (c) Divisible by none of 3, 6 or 9 | (d) Divisible by 3, 6 and 9 |
| (e) Divisible by none of 3, 6 or 9 | |
| 3. (a) Divisible by 7 and 11 | |
| (b) Divisible by 7 and 11 | |
| (c) Divisible by 7 | |
| (d) Not divisible by 7 or 11 | |
| (e) Divisible by 7 and 11 | |
| 4. (a) Divisible by 4 | |
| (b) Divisible by 4 and 8 | |
| (c) Divisible by 4 | |
| (d) Divisible by none of 4 or 8 | |
| (e) Divisible by 4 | |

5.	2	3	4	6	8	9	11
28460	✓	✗	✓	✗	✗	✗	✗
315029	✗	✗	✗	✗	✗	✗	✓
28314	✓	✓	✗	✓	✗	✓	✓
9252	✓	✓	✓	✓	✗	✓	✗
21340	✓	✗	✓	✗	✗	✗	✓
27148	✓	✗	✓	✗	✗	✗	✓
14256	✓	✓	✓	✓	✓	✓	✓

6. (a) 0 or 3 or 6 or 9 (b) 0 or 3 or 6 or 9
 (c) 3 or 9 (d) 8
7. (a) A = 2, B = 9, D = 1 (b) A = 2, B = 5, C = 1
 (c) A = 6, B = 2 (d) A = 8
 (e) A = 2, B = 5

Exercise 5.2

1. (a) 12 (b) 99
2. (a) 0 (b) 22 (c) 0
3. (a) The number in general form is :
 $a \times 100 + b \times 10 + (a+2) = 101a + 10b + 2$
 The reversed number is $(a+2) \times 100 + b \times 10 + a = 101a + 10b + 200$
 The difference = 198
 Reverse of difference = 891
 $198 + 891 = 1089$
- (b) Subtract 165 from the final answer and divide the remainder by 100 to get the original number.
4. (a) 63, 71 (b) 324, 972 (c) 27, 37 (d) 96, 6144
 (e) 55, 89
5. 124

Exercise 5.3

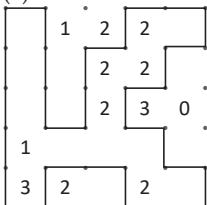
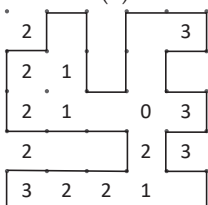
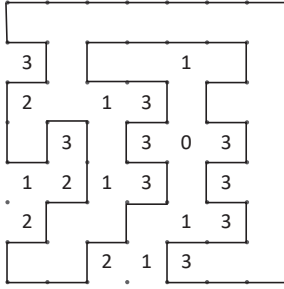
1. (a)

16	9	14
11	13	15
12	17	10

 (b)

48	41	46
43	45	47
44	49	42

 (c)

36	29	34
31	33	35
32	37	30
2. (a)  (b)  (c) 
4. 1225 $\left(\frac{50 \times 49}{2}\right)$ 5. 0 $[(x - x) = 0]$

Exercise 6.1

1. (a) $2x, -3y, 6; 2, -3, 6$ (b) $x^2y, 11xy^2, -13xy; 1, 11, -13$
 (c) $\frac{13}{2}xyz, 7xy, \frac{-24}{5}yz; \frac{13}{2}, 7, \frac{-24}{5}$ (d) $15, -8x^3, y^3, -27x^3y^3; 15, -8, 1, -27$
 (e) $\frac{4}{3}x^2, -11x, \frac{-13}{3}; \frac{4}{3}, -11, \frac{-13}{3}$ (f) $125x, -15y; 125, -15$
2. (a) Binomial (b) Monomial (c) Polynomial (d) Binomial
 (e) Trinomial (f) Polynomial
3. (a) $7xy^3 + 3x^2y - 8xy, 4$ (b) $\frac{-15}{4}x^{16} + 3x^{11} + 4x^6 + 67x, 16$
 (c) $\frac{-13}{9}x^{49} + 76x^{33} - 12x^{23} + \frac{14}{5}x^{19}, 49$ (d) $-5x^4 + 18x^3 - 3x^2 + 12x + 17, 4$
 (e) $-4x + 11, 1$ (f) $23x^2y^3 + 45xy^2 - 18xy + 35x, 5$
4. (a) $11x^2 + 15x - 6$ (b) $52x^3y^3 - 25xy^3 + 19x^3y - 18xy$
5. (a) $12x^4 - 26x^3 + 10x^2 - 2x - 84$ (b) $\frac{-2}{3}x^3 + \frac{54}{5}y^3 - \frac{41}{4}x^2y$
6. $4x^3 + 15x^2 + 12x + 34$ 7. $-2x^4 + 5x^3 - 17x^2 - 60x + 24$
8. $-9x^4 + 13x^3 + 17x^2 - 11x - 20$ 9. $-3x^3 + 33x^2 + 30x - 86$
10. $20x^3 - 24x^2 + 38x - 42$

Exercise 6.2

1. (a) $-24x^4y^2$ (b) $\frac{-28}{9}xy^7$ (c) $3x^3y^4z^2$
2. $-28x^3y^3$
3. (a) $12m^2n^3$ (b) $33a^3b^3$ (c) $15x^2 + 14xy - 8y^2$
4. (a) $6xy^4 - 14x^3y^2 + 28x^3y - 12xy^3$ (b) $21x^2 - 55y^2 + 2xy - 33x + 81y - 18$
 (c) $-36x^3 - 40y^3 + 124xy^2$ (d) $4x^4 - 22x^3 + \frac{166}{5}x^2 - \frac{33}{5}x + \frac{48}{5}$
 (e) $26x^2y - \frac{65}{4}xy^2$ (f) $24x^3 - 18x^2 + 45x + 54$
5. (a) $-6x^3 - 25x^2 + 11x$ (b) $\frac{9}{2}x^3 - \frac{79}{14}x^2 + \frac{131}{7}x - \frac{18}{7}$
 (c) $6x^2 + 20xy - 11x - 46y + 12$ (d) $-10x^5 + 12x^4 - 38x^3 - 40x^2 - 12x + 2$
 (e) $\frac{5}{2}x^4 - \frac{89}{6}x^3 + \frac{201}{4}x^2 - \frac{251}{3}x + 78$
6. (a) $\frac{-245}{48}$ (b) $\frac{-91}{18}$ (c) $\frac{-9}{64}$
7. (a) $60x^3 + 11x^2y - 25xy^2 - 6y^3$ (b) $\frac{3}{2}x^4y^6z^3$
 (c) $84x^3 + 17x^2y - 44xy^2 - 12y^3$
8. $27x^3 + 135x^2 + 225x + 125$
9. $42xy^3 - 66x^3y - 36x^2y^2 + 10x^3 - 84y^3 + 26x^2y - 40xy^2 - 121x^2 - 77y^2 + 66xy$
10. $2x^3 + 18x^2 - 16x - 104$ 11. $-3x^3 + 7x^2 - 8x + 27$
12. $4x^4 + 16x^3 - 104x^2 + 145x - 64$

Exercise 6.3

- $-16xy^2$
 - $\frac{3}{4}$
 - $-xyz$
 - $\frac{36}{5}xy^2z^2$
 - $-\frac{14}{3}ab^3$
 - $\frac{10}{3}xy$
- $\frac{18}{5}x^2y + \frac{27}{5}y - 9x^3y$
 - $-15a + 8b - \frac{9}{2}$
 - $\frac{10}{3}mn^4 + \frac{14}{3}n^2 - \frac{8}{3}m^3$
 - $5 - 12x + \frac{40y}{7x^2}$
- $x^2 - 3x + 2$, remainder = 0
 - $4x^2 - 6x - 6$, remainder = 37
 - $6x^2 + 17x + 4$, remainder = $52x - 2$
 - $2x^2 + 3x - 2$, remainder = 0
- No
 - Yes
 - No
 - Yes
- $2x^2 - 5x - 7$
- $a = 20, b = -24$

Exercise 6.4

- $x^2 + 4x + 3$
 - $y^2 + 2y - 15$
 - $x^2 + 2x + \frac{8}{9}$
 - $x^4 - x^2 - 12$
 - $a^2 - 11a + 30$
 - $\frac{x^2}{y^2} + \frac{5x}{y} - 14$
- $64x^2 + 80xy + 25y^2$
 - $49x^2 - 42xy + 9y^2$
 - $16x^4 - 40x^2 + 25$
 - $\frac{4}{25}x^2 - \frac{2}{3}xy + \frac{25}{36}y^2$
 - $0.04x^2 + 0.2xy + 0.25y^2$
 - $\frac{16}{49}x^4 + \frac{5}{7}x^2y^2 + \frac{25}{64}y^4$
 - $36x^2 - 25$
 - $\frac{9}{16}x^4 - \frac{49}{9}y^2$
- $25x^2 + 4y^2 + 9z^2 - 20xy - 12yz + 30xz$
 - $\frac{729}{8}x^3 - 81x^2y + 24xy^2 - \frac{64}{27}y^3$
 - $125x^3 + 300x^2y + 240xy^2 + 64y^3$
 - $\frac{9}{16}x^2 + \frac{36}{25}y^2 + \frac{25}{4}z^2 + \frac{9}{5}xy - 6yz - \frac{15}{4}zx$
 - $27x^3 - 216x^2y + 576xy^2 - 512y^3$
 - $1331x^3 + 2178x^2y + 1188xy^2 + 216y^3$
 - $-343x^3 + 735x^2 - 525x + 125$
 - $64x^2 + 49y^2 + 25z^2 - 112xy + 70yz - 80zx$
- $80xy$
 - $40xy - 32zx$
 - $1024x^3 + 1728xy^2$
 - $2xy$
- 9025
 - 11236
 - 2916
 - 7744
 - 180
 - 26000
 - 4158
 - 10088
- 830584
 - 1191016
 - 140608
 - 300763
- 85
- 34
- 1603
- $\frac{73}{36}$
 - $\frac{-107}{216}$

Exercise 6.5

- (a) $2x - x + 4x = 5x$ (add coeff. of x)
(b) $(-4y^2)^4 = 256y^8$ (laws of exponent)
(c) $\frac{4x-6y}{2} = 2x - 3y$ (divide each term)
(d) $(z + 10)^2 = z^2 + 20z + 100$ (use identity)
(e) $4(2x + 7) = 8x + 28$ (multiply each term)
(f) $\frac{x+9}{3} = \frac{x}{3} + 3$ (divide each term)
(g) $2x + 3x = 5x$ (addition of like terms)
(h) $(y - 5)^3 = y^3 - 15y^2 + 75y - 125$ (use identity)

MCQ-V

1. $\frac{-11}{5}y$ 2. $3x^3y^3, 8x^3y^3$ 3. $2x^3 - 12x^2 + 28x - 30$
4. $\frac{-3}{2}xy^2$ 5. 15129 6. $x^4 + 2x^2 - 48$
7. $-4x - 30$ 8. 0 9. 13 10. 258000

Revision Exercise

1. (a) $x^2 - 2x - 15$ (b) $x^2 - a^2$ (c) $x^3 - 3x^2y + 3xy^2 - y^3$
(d) 7 (e) $-45y^2$
2. (a) False (b) False (c) True (d) True
3. $x^4 - 11x^2 + 6$
4. (a) $4x^2, -5x, 11$; 4, -5, 11 (b) $3x^2y, -18xy^2, 13xy$; 3, -18, 13
(c) $-9ab^3, \frac{-11}{4}a^2b^2, 5a^3b$; -9, $\frac{-11}{4}, 5$
5. (a) $3x^3 + 7x^2 + 19x + 7$ (b) $\frac{9}{4}x^4 + \frac{122}{35}x^3 + \frac{3}{4}x^2 - \frac{19}{2}x + \frac{32}{5}$
6. (a) $10x^3 + \frac{22}{3}x^2 + \frac{19}{4}x + \frac{85}{88}$ (b) $14x^3 - 43x^2 - 6x - 86$
7. (a) $-72x^4y^5$ (b) $8x^2 - 12x - 56$
(c) $6x^4 + 7x^3 - 15x^2 + 47x - 21$
(d) $x^6 - 8x^5 + 15x^4 - 13x^3 + 16x^2 - 5x + 2$
8. (a) $47x^2 - 71x - 15$ (b) $6x^4 - 78x^3 + 9x^2 + 37x - 42$
9. $6x^3 + 29x^2 - 40x + 12$; 315
10. (a) $Q = 2x^2 + 6x - 11, R = 0$ (b) $Q = 3x^2 + 11x - 6, R = 2x - 8$
11. (a) Yes (b) No
12. (a) $x^2 + 8x - 33$ (b) $16x^2 - 56xy + 49y^2$
(c) $9x^4 + 12x^2 + 4$ (d) $16x^2 - 9y^2$

(e) $x^4 - 13x^2 + 36$

(f) $27x^3 - 54x^2y + 36xy^2 - 8y^3$

(g) $125x^3 + 450x^2y + 540xy^2 + 216y^3$

(h) $64x^2 + 4y^2 + 25z^2 - 32xy - 20yz + 80zx$

13. (a) 7921

(b) 12544

(c) 4891

(d) 45000

(e) 884736

(f) 1092727

14. (a) $x^2(4x^3 - 11x) = 4x^5 - 11x^3$ (multiply each term)

(b) $(3x - 4) - (12x + 11) = 3x - 12x - 4 - 11$ (check sign while operating brackets)

(c) $\frac{6x-2}{2} = 3x - 1$ (divide each term)

(d) $(4x - 5)^2 = 16x^2 - 40x + 25$ (use identity)

Chapter 7**Factorisation**

Exercise 7.1

1. (a) $4xy^3$

(b) $2 \times 3 \times 3 \times x \times x \times x \times y \times y$

(c) regrouping

(d) factors

2. (a) $25x^2y = 1 \times 25x^2y = 25 \times x^2y = 25x \times xy = 25x^2 \times y = 25y \times x^2$
 $= 5 \times 5x^2y = 5x \times 5xy = 5y \times 5x^2$

(b) $-7x^2y^2 = 1 \times -7x^2y^2 = -1 \times 7x^2y^2 = -7 \times x^2y^2 = -7x^2 \times y^2 = -7y^2 \times x^2$
 $= 7x^2 \times -y^2 = 7y^2 \times -x^2 = -7xy \times xy = 7xy \times -xy = -7x^2y \times y$
 $= 7x^2y \times -y = -7xy^2 \times x = 7xy^2 \times -x = -7 \times x \times x \times y \times y$

(c) $x^2y = 1 \times x^2y = x^2 \times y = x \times xy = x \times x \times y$

(d) $-4xy = -1 \times 4xy = 1 \times -4xy = -4 \times xy = 4 \times -xy = -4x \times y$
 $= 4x \times -y = -4y \times x = 4y \times -x = -2 \times 2 \times x \times y = -2x \times 2y$
 $= 2x \times -2y = 2 \times 2 \times -x \times y = 2 \times 2 \times x \times -y$

3. (a) $4xy^2$

(b) $5xy$

(c) $5ab^2$

(d) 1

4. (a) $9x^2y^2 = 1 \times 9x^2y^2 = 9 \times x^2y^2 = 9x^2 \times y^2 = 9y^2 \times x^2 = 9x \times xy^2$
 $= x \times 9xy^2 = y \times 9x^2y = 9y \times x^2y = 9xy \times xy = 3 \times 3 \times x^2 \times y^2$
 $= 3 \times 3 \times xy \times xy = 3xy \times 3xy = 3x \times 3xy^2 = 3y \times 3x^2y = 3x^2 \times 3y^2$

(b) $2abc = 1 \times 2abc = 2 \times abc = 2 \times a \times b \times c = 2a \times bc = 2b \times ac$
 $= 2c \times ab = 2ab \times c = 2bc \times a = 2ac \times b$

(c) $6x^2y = 1 \times 6x^2y = 6 \times x^2y = 6x^2 \times y = 6y \times x^2 = 6xy \times x = 6x \times 6xy$
 $= 2 \times 3 \times x \times x \times y = 2x \times 3xy = 2y \times 3x^2 = 2x^2 \times 3y = 2xy \times 3x$

(d) $-2yz^2 = 1 \times -2yz^2 = -1 \times 2yz^2 = -2 \times yz^2 = 2 \times -yz^2 = -2y \times z^2$
 $= 2y \times -z^2 = -2z \times yz = 2z \times -yz = -2 \times y \times z \times z = -2yz \times z = 2yz \times -z$
 $= -2z^2 \times y = 2z^2 \times -y$

5. (a) $2 \times 2 \times 2 \times 11 \times x \times x \times (2x - 3y)$

(b) $2 \times 2 \times 2 \times 2 \times 5 \times y \times (2x + 3y)$

- (c) $x \times x \times x \times y \times y \times y \times y$
 (d) $-3 \times 5 \times x \times y \times (x + y)$
6. (a) $10xy^2z(12xz^2 + 5 - 3x^2yz)$ (b) $27(2ab^3 - 3bc^2 + a^2c^3)$
 (c) $5pr(25q^2 + 9r - 18p^2q^2r)$ (d) $12m^2n^2(m^2 - 3mn + 4n)$
7. (a) $3(-5x + 2y)$ (b) $2ab(2b + 5a)(3 - a^2b^3)$
 (c) $(3x - y)(3x + 4)$ (d) $3(2x^2 - 1)(6xy^2 - 9z + 10x^2yz^2)$
8. (a) $2(6x - 2y + 9z)$ (b) $4xy(11x - 7y^2 + 4z)$
 (c) $9x^2(1 - 3x + 4x^3)$ (d) $11m^3n^2(7m - 1 + 3n^2)$

Exercise 7.2

1. (a) $20xy^3(4xy^2 - 1)$ (b) $5m^2n^2(45m - 35n - 18m^2)$
 (c) $pq(64q + 25p)$ (d) $4abc(11c - 6ac^2 + 15ab^2)$
2. (a) $(5x - 8y)(5x + 8y)$ (b) $\left(\frac{4}{3}u - \frac{5}{8}v\right)\left(\frac{4}{3}u + \frac{5}{8}v\right)$
 (c) $2(5x - 3)(5x + 3)$ (d) $(9q^2 + 25r^2)(3q - 5r)(3q + 5r)$
 (e) $(1 - 2m)(1 + 2m)(1 + 4m^2)$ (f) $12(3a - 4)(3a + 4)$
3. (a) $(6x - 5)(6x - 5)$ (b) $(7y + 3)(7y + 3)$
 (c) $8(3m - 2)(3m - 2)$ (d) $(8x^2 + 3)(8x^2 + 3)$
 (e) $\left(\frac{7}{5}p - 1\right)\left(\frac{7}{5}p - 1\right)$ (f) $\left(\frac{5}{9}y - \frac{9}{5}z\right)\left(\frac{5}{9}y - \frac{9}{5}z\right)$
4. (a) $(x - 3)(x - 5)$ (b) $(m + 6)(m - 3)$
 (c) $(x + 9)(x + 5)$ (d) $(x - 8)(x + 2)$
 (e) $(z^2 + 14)(z^2 - 2)$ (f) $(y^2 - 11)(y^2 + 2)$
5. (a) $(a - 18)(a + 3)$ (b) $(y - 9)(y - 8)$
 (c) $(m + 6)(m - 2)$ (d) $(z + 11)(z + 3)$
 (e) $(x - 16)(x - 4)$ (f) $(p + 12)(p - 3)$
6. (a) $12xy^2(2x^2 + 3y + 4x)$ (b) $45(9m^2 - 11n^2)$
 (c) $(11 - 2y)(11 - 2y)$ (d) $6(2a^2 - 3b)(2a^2 - 3b)$
 (e) $(y + 10)(y + 5)$ (f) $(x^2 - 12)(x^2 + 6)$
 (g) $(x + 20)(x + 5)$ (h) $(x - 11)(x - 5)$
 (i) $3(16x^2 + 25y^2)(4x - 5y)(4x + 5y)$ (j) $(b - 1)(b + 1)(2b - 1)$
 (k) $2(3x - 5)(3x - 5)$ (l) $(5y - 2 - 9x)(5y - 2 + 9x)$

Exercise 7.3

1. (a) $11xy^2 - 16y^2 + 5x$ (b) $8x^2y^3 - \frac{7}{2}y - \frac{9}{2}x^2y$
 (c) $2x - \frac{1}{3}$ (d) $y(6 - 25xy)$
2. (a) $x - 3$ (b) $2x - 5$
 (c) $(3x + 5y)(9x^2 + 25y^2)$ (d) $(2x + 3y)(2x - 3y)$
3. (a) $4x - 5y$ (b) $x - 6$ (c) $y - 3$ (d) $2(y - 3)$

MCQ - VI

1. $12xy^2z^2$
2. $24 \times x^2 \times y$
3. $(x - 16)(x + 3)$
4. $(3x - 1)(2x - 1)(2x + 1)$
5. $4(12x + 5y)$
6. $p + q = a, pq = b$
7. $(x - y)(x + y)(x^2 + y^2)$
8. $(x^3 - 9)^2$
9. $4(2y - 3)^2$
10. $(3x - 14)(x + 1)$

Revision Exercise

1. (a) HCF of constants $\times$ HCF of variables
(b) $2 \times 19 \times x \times x \times y \times y \times y$ (c) $2x(x - 3)(2y - 3xz)$ (d) 12
2. (a) $30x^4(5y - 1)$ (b) $44xy(x - 6y)$
(c) $6x(2x - 3y)(3 + 4y)$ (d) $20a^3b(10a - 3)$
3. (a) $20x(8x^2 + 5x - 9)$ (b) $36xy^2(-11xy - 3 + 6x^2)$
(c) $3x(x - 12)(3x + 2)$ (d) $y^2z^2(y - z - 1)$
4. (a) $b(a - 1)(6a - 6 - 5b)$ (b) $2(5m + 4n)(4m + 9n)$
(c) $(3x - y)(y + 1)$ (d) $m(5 + 2n)(2m - 3n)$
5. (a) $(a - 4)(a + 4)(a^2 + 16)$ (b) $2x(x - 2y)(x + 2y)(x^2 + 4y^2)$
(c) $\left(\frac{11}{12}x - \frac{9}{8}yz\right)\left(\frac{11}{12}x + \frac{9}{8}yz\right)$ (d) $5xy^3z^4(5xy - z)(5xy + z)$
(e) $(8ab - 3cd)(8ab + 3cd)$ (f) $(1 - 5y)(1 + 5y)$
(g) $2x^4(7x - 12)$ (h) $3x^4(-x^2 + 5)$ (i) $n(7m - 3n)$
6. (a) $-16x^2(x^2 - 2x - 5)$ (b) $(8a + 7)(8a + 7)$
(c) $(17y + 1)(17y + 1)$ (d) $\left(\frac{5}{6}z - \frac{3}{4}y\right)\left(\frac{5}{6}z - \frac{3}{4}y\right)$
(e) $4y(y - 10)(y - 10)$ (f) $(4x - 7y)(4x - 7y)$
(g) $(x - 10)(x - 10)$ (h) $(x + 18)(x + 5)$
(i) $(x - 21)(x + 4)$
7. (a) $(x - 10)(x - 8)$ (b) $(x + 6)(x - 5)$
(c) $(x + 6)(x - 3)$ (d) $(x + 12)(x + 5)$
(e) $(x - 11)(x - 5)$ (f) $(x + 10)(x - 9)$
(g) $(x + 6)(x + 2)$ (h) $(x + 12)(x - 6)$
(i) $(x - 5)(x + 2)$
8. (a) $2(7x^2 - 11)(7x^2 + 11)$ (b) $5x^2(x - 5)(x + 3)$
(c) $(2a + 5b)(2a + 5b - 5)$ (d) $(9x - 1 - 4y)(9x - 1 + 4y)$
(e) $(5x - 2)(5x + 2)(25x^2 + 4)$ (f) $(x - y)(x + y)(x^2 + y^2 - 2)$

Chapter 8

Linear Equations in One Variable

Exercise 8.1

1. (a), (c) and (f)
2. (a) LHS = $x - 2y$, RHS = 0 (b) LHS = $4x + 6y$, RHS = 24
(c) LHS = $\frac{5}{3}x + 12$, RHS = $\frac{4}{3}x - 36$ (d) LHS = $3x + 2y$, RHS = 12
(e) LHS = $x - y$, RHS = -7 (f) LHS = $3y$, RHS = $5x - 10$

3. (a) $x = 3$ is not a solution (b) $x = 6, y = -5$ is a solution
 (c) $x = 8$ is a solution
 (d) $x = 5$ is a solution but $x = 2$ is not a solution
 4. (a), (d) and (f)

Exercise 8.2

1. (a) $\frac{16}{5}$ (b) 8 (c) 8 (d) 8
 2. (a) $\frac{25}{4}$ (b) 1 (c) $\frac{-9}{110}$ (d) 8 (e) $\frac{-3}{4}$ (f) 36
 3. (a) 6 (b) $\frac{133}{7}$ (c) 3 (d) -5 (e) -7 (f) $\frac{7}{5}$
 4. (a) 11 (b) 7 (c) -1 (d) $\frac{77}{19}$
 (e) $\frac{-17}{2}$ (f) $\frac{88}{5}$ (g) 1 (h) 2

Exercise 8.3

1. 39, 46 2. 142, 144, 146
 3. Geeta's age = 15 yrs, Father's age = 45 yrs
 4. $\frac{25}{3}$ 5. 23, 25, 27 6. $55^\circ, 110^\circ, 15^\circ$
 7. 57 8. $L = 11\text{ cm}, B = 3\text{ cm}$ 9. $\frac{3}{7}$
 10. 2 km/hr 11. Sonu's age = 15 yr, Sonali's age = 9 yr
 12. $65^\circ, 115^\circ$ 13. $50^\circ, 60^\circ, 70^\circ$ 14. 133 cm^2 15. 6 hr
 16. Cost of one ball point pen = ₹8, cost of one fountain pen = ₹12
 17. Length = 100 m , breadth = 50 m
 18. Number of ₹10 notes = 35, number of ₹20 notes = 18

MCQ - VII

1. $2x - 8 = 10 - 3x$ 2. $\frac{25}{2}$ 3. 18 4. 60
 5. 41, 57 6. 108, 114, 120 7. 16, 28 8. 51°
 9. 35 years 10. $45\text{ m}, 15\text{ m}$

Revision Exercise

1. (a) and (c)
 2. (a) $y = 6$ is not a solution
 (b) $x = 20$ is a solution but $x = 10$ is not
 (c) $x = 16$ is a solution but $x = 3$ is not
 3. (a) $\frac{67}{2}$ (b) 27 (c) 2 (d) $\frac{51}{7}$
 (e) $\frac{-1}{7}$ (f) $\frac{13}{6}$ (g) $\frac{3}{10}$ (h) -1
 4. (a) $\frac{18}{7}$ (b) $\frac{41}{10}$ (c) $\frac{-62}{29}$ (d) 6
 (e) $\frac{27}{4}$ (f) 40
 5. 10 6. $A = ₹7500, B = ₹12500, C = ₹15000$
 7. 62 8. 25, 27 9. 53 10. $\frac{4}{9}$
 11. $28^\circ, 84^\circ, 68^\circ$ 12. 8 years
 13. $l = 31\text{ cm}, b = 17\text{ cm}$ 14. 600 l

Exercise 9.1

- (a) 8% (b) $62\frac{1}{2}\%$ (c) $41\frac{2}{3}\%$ (d) $86\frac{2}{3}\%$ (e) $71\frac{3}{7}\%$ (f) $337\frac{1}{2}\%$
- (a) 80% (b) 0.5% (c) 78% (d) 15.8% (e) 140% (f) 765%
- (a) $11\frac{1}{9}\%$ (b) $71\frac{3}{7}\%$ (c) 92% (d) 20% (e) $212\frac{1}{2}\%$ (f) $301\frac{1}{3}\%$
- (a) $\frac{6}{25}$ (b) $\frac{37}{200}$ (c) $\frac{5}{8}$ (d) $\frac{1}{2000}$ (e) $\frac{111}{125}$ (f) $\frac{27}{20}$
- (a) 0.00892 (b) 0.006 (c) 0.125 (d) 0.004 (e) 0.352 (f) 0.0675

Exercise 9.2

- (a) 7.28 (b) 135 kg (c) 10 inches (d) ₹18.75
- (a) 240% (b) $76\frac{4}{21}\%$ (c) $71\frac{3}{7}\%$ (d) 225%
- 50000, 32500, 17500
- 900
- $13\frac{1}{23}\%$
- $14\frac{2}{7}\%$
- $23\frac{1}{3}\%$
- English
- 8% decrease
- 20%

Exercise 9.3

- (a) Profit $11\frac{1}{9}\%$ (b) Profit $16\frac{2}{3}\%$ (c) Loss 12.5% (d) Loss $33\frac{1}{3}\%$
- (a) SP = ₹784 (b) CP = ₹1500 (c) CP = ₹656 (d) SP = ₹637.50
- Profit $11\frac{1}{9}\%$ 4. Loss = 20% 5. 12% 6. ₹3036
- ₹10350 8. CP = ₹1600, Profit = ₹400 9. Loss 1%
- ₹4500 11. CP = ₹800, SP = ₹896
- SP of first = ₹540, SP of second = ₹690

Exercise 9.4

- (a) ₹360 (b) ₹875
- (a) Discount = ₹50, 10% (b) Discount = ₹60, 8%
- ₹1800
- Total discount = ₹193.20, Amount returned = ₹673.20
- ₹7000 6. ₹25000 7. ₹4533.76 8. ₹45
- 42.625% 10. 45% 11. ₹2832 12. ₹2316.16

MCQ - VIII

- 2.75% 2. 15.625 3. 40% 4. $28\frac{4}{7}\%$
- $36\frac{4}{11}\%$ 6. ₹6325 7. 70 8. $33\frac{1}{3}\%$
- 25% 10. ₹724.50

Revision Exercise

1. (a) 200 (b) 564
2. 25% 3. $56\frac{1}{4}\%$ 4. 500
5. old price = ₹32, new price = ₹40
6. B
7. Laxmi = ₹10000, Rajeev = ₹12000, Sunil = ₹13200
8. Profit 25% 9. $2\frac{1}{2}\%$ Profit 10. Loss 1% 11. ₹1650
12. 120 13. 18 14. 66% 15. ₹14360.50
16. ₹2185

Chapter 10

Interest

Exercise 10.1

1. (a) ₹2160, ₹14160 (b) ₹3000, ₹11000
(c) ₹800, ₹8000 (d) ₹88.20, ₹2188.20
2. 3 years 3. $\frac{11}{2}\%$ or $5\frac{1}{2}\%$ 4. ₹120000, ₹16800
5. ₹26000, ₹80000 6. ₹18000 7. ₹24000, 5.5%
8. ₹4480 9. ₹10500, 9% 10. ₹30000, ₹50000

Exercise 10.2

1. (a) ₹66550, ₹16550 (b) ₹134480, ₹6480
(c) ₹56953.125, ₹16953.125 (d) ₹972405, ₹172405
2. ₹47640.64, ₹7640.64
3. ₹172.80 4. ₹9364.80 5. ₹40000
6. 4% p.a. 7. 18 years 8. ₹41580
9. (a) ₹26620, ₹6620 (b) ₹140608, ₹15608 (c) ₹18008.14, ₹2008.14
10. ₹40 11. 10% p.a. 12. ₹30547, ₹4947
13. ₹30000 14. ₹15000, 20% p.a. 15. 2 years

Exercise 10.3

1. 1.22 m 2. ₹240975, ₹109025 3. 10985000 4. 2.07575×10^7
5. 4.2042 tons 6. 49140
7. (a) 64000 (b) 777924 8. 2304

MCQ-IX

1. $P + \frac{P \times R \times T}{100}$ 2. ₹750 3. 0.25%
4. ₹1250 5. 8% 6. 15 years
7. 12% 8. 828 9. 10% 10. Scheme 1

Revision Exercise

- (a) ₹2047.50, ₹80047.50 (b) ₹3840, ₹123840
- ₹2000 3. $2\frac{1}{2}$ years 4. ₹3000 5. ₹62500
- ₹5000 7. ₹16000, 5% p.a. 8. ₹24000
- 10% p.a. 10. ₹15300 11. 19800 12. ₹80000
- ₹46875 14. ₹930 15. 4% p.a.

Chapter II

Direct and Inverse Variations

Exercise II.1

- (a), (b), (c), (d)
- (a) No (b) No (c) Yes
- (a)

x	18	(54)	108	(96)	144
y	3	9	(18)	16	(24)

 (b)

a	(15)	75	120	(1100)	80
b	3	(15)	24	220	(16)
- (a) 68 (b) 93 5. 91
- 262500
- (a) ₹37500 (b) ₹6300
- (a) 9 days (b) ₹3060
- 24 m 7. ₹800
- (a) 3.75 m (b) 9 m
- (a) 6 days (b) 2640 km

Exercise II.2

- (a), (b) and (c)
- (a)

x	18	(8)	3	(36)
y	4	9	(24)	2

 (b)

a	(100)	75	12	(15)	60
b	3	(4)	25	20	(5)
- (a) Yes (b) No
- 8 5. 56
- (a) 10 hr (b) 50 km/hr
- ₹300
- 5 kg 7. 5 days
- (a) 160 (b) 6

Exercise II.3

- 24 days 2. 9 days 3. 12 days 4. $7\frac{1}{2}$ days
- $11\frac{1}{13}$ days 6. $\frac{8}{15}$ 7. $7\frac{1}{2}$ hr 8. 6 days
- 60 min 10. 24 days

Exercise II.4

- 720 km/hr 2. (a) 54 km/hr (b) $6\frac{1}{2}$ hr
- 225 km 4. $71\frac{1}{9}$ km/hr 5. 9 s 6. 24 s
- 425 m 8. 48 km/hr 9. 48 km/hr 10. 60 km/hr

MCQ-X

- 28 2. 18 3. 8 days 4. 4 5. 25
- $4\frac{1}{2}$ hr 7. 52 seconds 8. 30 minutes 9. 630 m 10. 60

Revision Exercise

1. (a) Direct (b) Inverse (c) Direct (d) Inverse
 2. (a) Inverse (b) Direct

x	45	(15)	36	18	(30)
y	8	24	10	(20)	12

x	60	(36)	144	84	(288)
y	25	15	60	(35)	120

3. (a) 121 4. (a) 30 (b) 8 5. 49 6. (a) 25 (b) 1080
 7. 200 8. 80 days 9. 15 days
 10. 16 days, $X = 48$ days, $Y = 28\frac{4}{5}$ days, $Z = 144$ days
 11. 24 hrs 12. $11\frac{2}{3}$ days 13. 22 seconds
 14. $68\frac{4}{7}$ km/hr 15. 9 hrs

Chapter 12

Visualising Shapes

EXERCISE 12.1

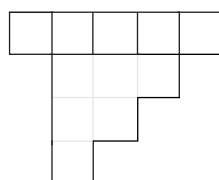
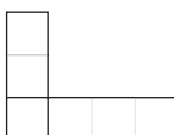
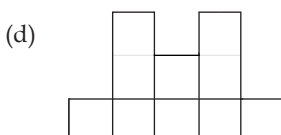
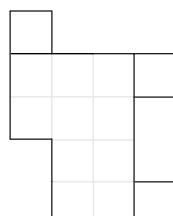
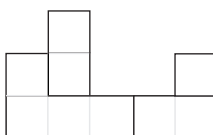
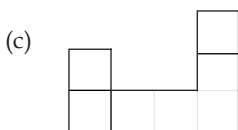
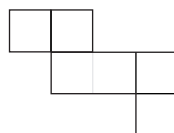
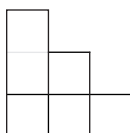
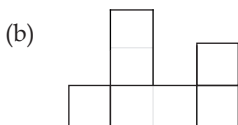
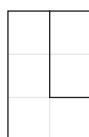
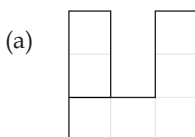
1. 2D 3D 3D 2D 3D 2D 3D

2. (a) Cylinder, Cone, Hemisphere (b) Prism, Cuboid
 (c) Sphere, Cylinder (d) Cube, Pyramid, Cuboid, Cylinder

4. **Front**

Side

Top



5.

Front

Side

Top

(a)

(b)

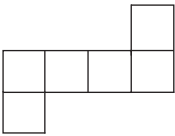
(c)

EXERCISE 12.2

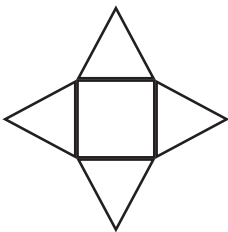
1.

F	E	V
5	⑨	6
⑥	10	6
8	18	⑫
⑦	⑫	⑦
⑥	⑫	⑧

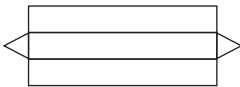
2. (a) Cube



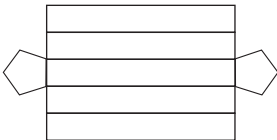
(c) Square Pyramid



(b) Triangular Prism



(d) Pentagonal Prism



Chapter 13 Understanding Quadrilaterals

Exercise 13.1

1. (a) Heptagon

(b) Quadrilateral

(c) Nonagon

(d) Triangle
2. (a) 540

(b) 9

(c) Polygon

(d) Regular
3. (a) False

(b) False

(c) True

(d) True
4. (a) Concave

(b) Convex

(c) Concave

(d) Concave
5. (a) Sides - AB, BC, CA

Diagonals - None

- (b) Sides - AB, BC, CD, DE, EF, FA
 Diagonals - AC, AD, AE, BD, BE, BF, CE, CF, DF
- (c) Sides - JK, KL, LM, MN, NO, OP, PQ, QJ
 Diagonals - JL JM, JN, JO, JP, KM, KO, LP, MO, MP, MQ, NP, NQ, OQ
- (d) Sides - WX, XY, YZ, ZW
 Diagonals - WX, XZ
6. (a) 1080° (b) 1800° (c) 540° (d) 1440°
 7. 5 8. 15
 9. (a) 115 (b) 80 (c) 30 (d) 110

Exercise 13.2

1. (a) PQ, RS and QR, SP (b) SP, PQ and QR, RS
 (c) PR, QS (d) $\angle PQR$, $\angle QRS$ and $\angle RSP$, $\angle SPQ$
2. 140° 3. 90° 4. 60° , 84° , 84° , 132°
5. They are also supplementary.
6. 100° , 100° , 100° , 60°
7. $\angle P = 55^\circ$, $\angle Q = 110^\circ$, $\angle R = 165^\circ$, $\angle S = 30^\circ$
8. (a) 110 (b) 65 (c) 12

Exercise 13.3

1. MNQP, MNFE, MNCB, PQFE, PQCB, EFCB
2. $\angle A = 62^\circ$, $\angle B = 118^\circ$, $\angle C = 62^\circ$, $\angle D = 118^\circ$
3. 75° , 105° , 75° , 105° 4. 30
5. (a) JM = ML and JK = KL (b) $\angle MJK = \angle MLK$
 (c) MK (d) Right Angle (90°)
6. $\angle CDB = 55^\circ$, $\angle ADB = 55^\circ$
7. $x = 15$, $y = 20$
8. $\angle W = 40^\circ$, $\angle X = 140^\circ$, $\angle Y = 40^\circ$, $\angle Z = 140^\circ$
9. 11 cm
10. JK = 15 cm, KL = 30 cm, LM = 15 cm, MJ = 30 cm

Exercise 13.4

1. (a) Rectangle / Square (b) Rectangle / Square
 (c) Rhombus / Square (d) Perpendicular, bisect
2. (a) Rectangle / Square (b) Parallelogram
 (c) Isosceles Trapezium (d) Rhombus / Square
3. 61° 4. 28 cm 5. 25 cm
6. 45° , 135° , 45° , 135° 7. $x = 3$, Perimeter = 36 cm

MCQ - XI

1. kite 2. bisect each other 3. Rectangle 4. 50
 5. Rectangle 6. 115° , 65° , 115° 7. 81 cm^2 8. 48° , 132°
 9. Rhombus 10. 135°

Revision Exercise

1. (a) True (b) False (c) True
2. (a) Perpendicular (b) Rectangle / Square (c) 90°
3. (a) 252° (b) 324°
4. (a) 14 5. 12 6. $70^\circ, 110^\circ, 75^\circ, 105^\circ$
7. (a) 50 (b) 40 (c) 65
8. Rectangle or square
9. $76^\circ, 104^\circ, 76^\circ, 104^\circ$ 10. $36^\circ, 144^\circ, 36^\circ, 144^\circ$
11. $x = 30, y = 3$
12. Sides are 18 cm, 24 cm, diagonal is 30 cm
13. 17 cm
14. (a) 50 (b) 50 (c) 28
15. $\angle ABO = 45^\circ, \angle ODC = 45^\circ, \angle ACB = 45^\circ, \angle CBD = 60^\circ$

Chapter 15

Mensuration

Exercise 15.1

1. 666 cm^2 2. 180 m, 120 m 3. 3025 cm^2 4. 64 m
5. ₹108 6. 21 cm^2 7. 56 cm
8. Perimeter = 112 cm, Area = 336 cm^2
9. ₹4521.60 10. 210 m, ₹54250

Exercise 15.2

1. 264 cm^2 2. 20 cm, 480 cm^2 3. 20 cm, 28 cm 4. 28 m^2
5. 20 cm 6. 11 cm, 22 cm 7. 180 cm^2 8. 300 cm^2
9. (a) 220 cm^2 (b) 56 cm^2
10. (a) 3100 m^2 (b) 2450 m^2

Exercise 15.3

1. (a) LSA = 220 cm^2 , TSA = 460 cm^2
(b) LSA = 487.5 cm^2 , TSA = 987.5 cm^2
2. L = 15 cm, B = 9 cm, H = 3 cm
3. 11 cm 4. 544 cm^2 5. Area = 88 m^2 , cost = ₹440
6. LSA = 51.84 cm^2 , TSA = 77.76 cm^2
7. 1000 cm^2
8. (a) CSA = 1320 cm^2 , TSA = 4092 cm^2
(b) CSA = 2310 cm^2 , TSA = 10010 cm^2
9. LSA = 990 cm^2 , TSA = 1336.5 cm^2
10. 5:6 11. 50 12. ₹241.28
13. ₹26880 14. 7392 cm^2

Exercise 15.4

1. 64 2. 8 cm 3. ₹2880 4. 30 m
5. 112.5 kg 6. 2310 cm^3 7. 34650 cm^3 8. 31839.60 g
9. Ratio of CSA = 5:6, Ratio of volume = 5:9

10. 2772 cm^2 11. 5 cm
 12. $\text{LSA} = 352\text{ cm}^2$ $\text{TSA} = 754.28\text{ cm}^2$ (approx)
 13. 450 14. 1.63 cm (approx) 15. 1 cm
 16. 48000 17. 100

MCQ - XII

1. 504 cm^2 2. 5000 3. $\pi r^2 + 2\pi rh$ 4. 3 cm 5. 50
 6. 484 cm^2 7. 96 cm^2 8. 9 cm 9. 48510 10. 32 cm

Revision Exercise

1. 173 cm^2 (approx) 2. 1386 cm^2 3. 19.3 cm^2
 4. Area of Path = 1350 m^2 , Cost = ₹93750 5. ₹450
 6. Cost of levelling = ₹1694, Cost of fencing = ₹2640
 7. 750 m^2 8. 742 cm^2 9. 6425 m^2
 10. 264 cm^2 11. 401.92 cm^2 12. length = 15 m , area = 117 m^2
 13. length = 15 m , area = 1350 cm^2 14. 72 15. 49500 l

Chapter 16

Data Handling & Representation

Exercise 16.1

1. (a) Frequency (b) Inclusive (c) 7 (d) Range

2.

Heights (in cm)	Tally Marks	Frequency
139		2
140		5
142		1
146		2
148		4
149		2
150		4
151		2
152		2
153		2
154		1
158		1
160		2
Total		30

3.

Class Interval	Tally Marks	Frequency
100 - 110		3
110 - 120		3
120 - 130		2
130 - 140		3
140 - 150		5
150 - 160		5
160 - 170		3
170 - 180		2
180 - 190		2
190 - 200		1
200 - 210		3
Total		32

4. (a) 99 (b) 30 (c) 14

5. (a)

Class Interval	Tally Marks	Frequency
151 - 155		7
156 - 160		9
161 - 165		8
166 - 170		6
Total		30

- (b) Maximum plants attain a height of $156\text{--}160\text{ cm}$

6.

Class Interval	Tally Marks	Frequency
60 - 80		5
80 - 100		13
100 - 120		17
120 - 140		10
140 - 160		1
160 - 180		0
180 - 200		3
200 - 220		1
Total		50

7.

Monthly Expend. (in ₹)	Number of Families	Cummulative frequency
5000 - 10000	12	12
10000 - 15000	19	31
15000 - 20000	24	55
20000 - 25000	32	87
25000 - 30000	35	122
30000 - 35000	16	138
35000 - 50000	8	146
Total	146	

(a) 122

(b) ₹25000 - ₹30000

(c) 91

8.

Class Interval	Tally Marks	Frequency	Cummulative frequency
20 - 30		1	1
30 - 40		3	4
40 - 50		5	9
50 - 60		8	17
60 - 70		8	25
70 - 80		9	34
80 - 90		4	38
90 - 100		2	40
Total		40	

9.

Class Interval	Frequency	Cummulative frequency
25 - 30	4	4
30 - 35	⑨	13
35 - 40	16	②⑨
40 - 45	10	③⑨
45 - 50	③	42

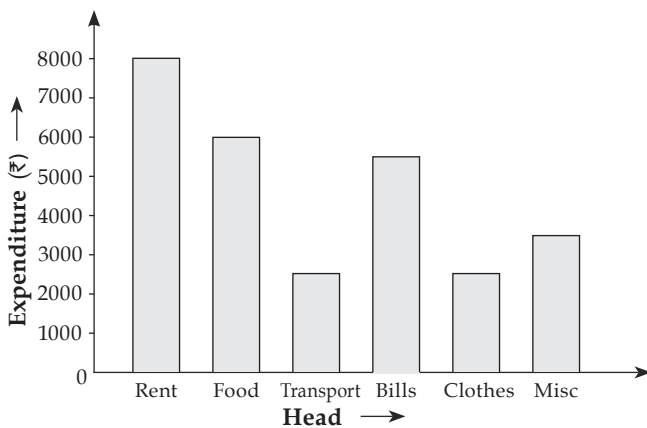
Exercise 16.2

- (a) 51.83 (approx) (b) 142.8
- 761 3. 152 cm 4. 12.9 5. 13
- (a) 9 (b) 70.16 kg (approx) (c) 55 7. 3
- (a) 25.40 (approx) (b) 25.85 (approx)
- 24 10. 1

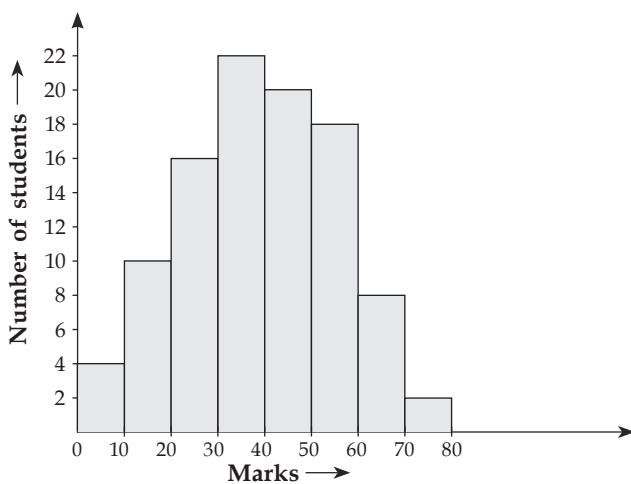
Exercise 16.3
 = 30 bottles

Hotel Name	A	B	C	D
Number of bottles	   	 	 	  

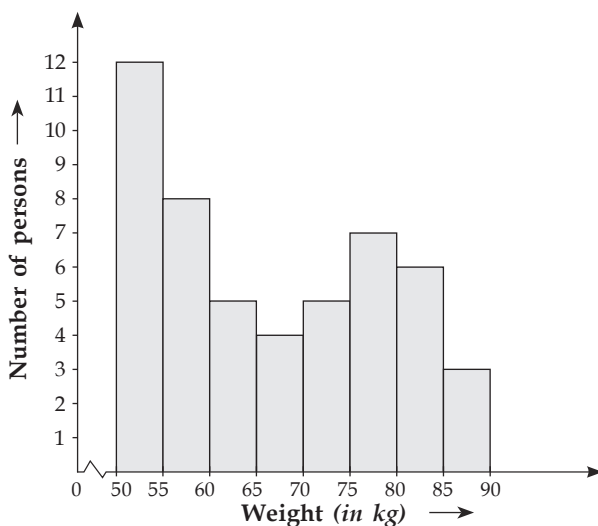
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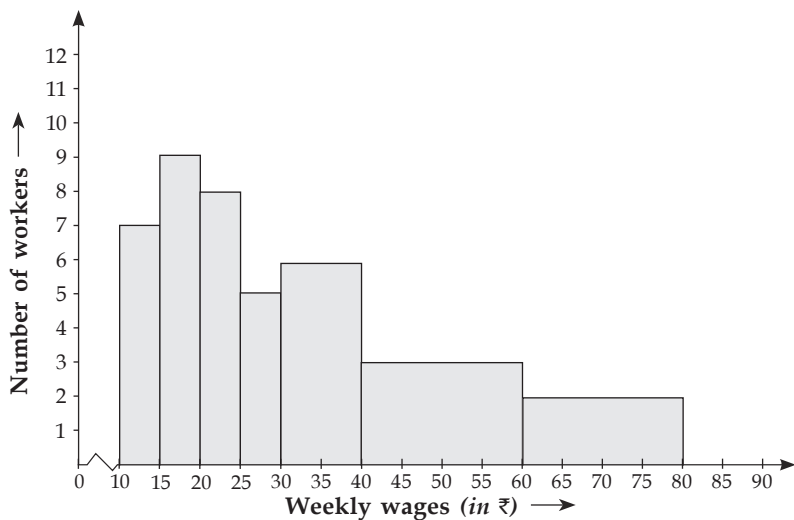
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4.

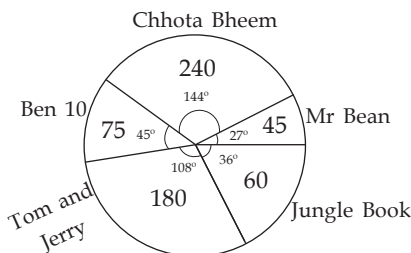


5.



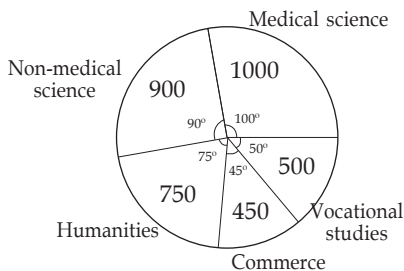
6.

Cartoon show	Sector angle
Chhota Bheem	144°
Ben 10	45°
Tom and Jerry	108°
Jungle Book	36°
Mr Bean	27°



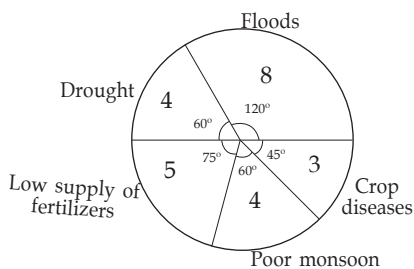
7.

Stream	Sector angle
Medical Science	100°
Non-medical Science	90°
Humanities	75°
Commerce	45°
Vocational Studies	50°



8.

Cause	Sector angle
Floods	120°
Drought	60°
Low supply of fertilizers	75°
Poor monsoon	60°
Crop diseases	45°

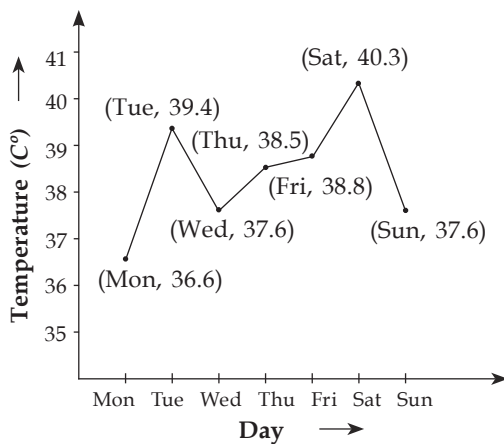


9. (a) Hindi

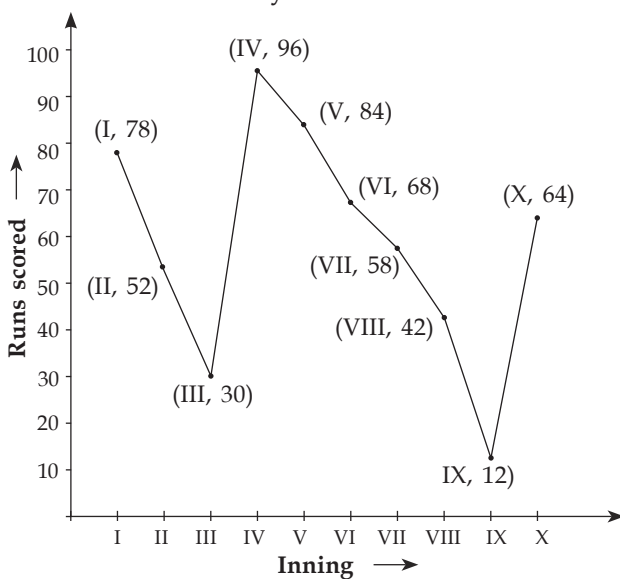
(b) 30

(c) Yes

10.



11.



Exercise 16.4

- (a) 0, 1 (b) 1 (c) $\frac{1}{2}$ (d) equal
- (a) $\frac{2}{9}$ (b) $\frac{1}{3}$ (c) $\frac{4}{9}$ (d) $\frac{2}{3}$
- $\frac{2}{5}$
- (a) $\frac{3}{7}$ (b) $\frac{4}{7}$ 5. $\frac{5}{7}$ 6. $\frac{5}{6}$ 7. $\frac{10}{11}$
- (a) $\frac{4}{9}$ (b) $\frac{2}{3}$ (c) $\frac{7}{9}$ 9. $\frac{1}{40}$ 10. $\frac{4}{5}$

MCQ - XIII

- 10
- 2.1
- 42.75
- 1:6
- 19
- $\frac{1}{6}$
- 5000
- 0.37
- Histogram
- $\frac{3}{5}$

Revision Exercise

1.

Blood group	Tally Marks	Frequency
A		13
B		12
AB		7
O		8
Total		40

2.

Class Interval	Tally Marks	Frequency
0 - 10		4
10 - 20		9
20 - 30		8
30 - 40		5
40 - 50		4
Total		30

3. 11.2

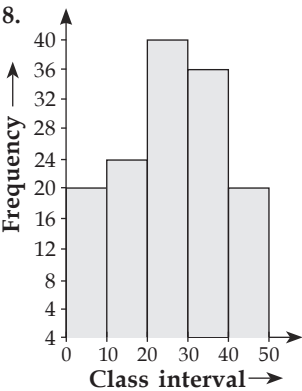
4. 17.275

5. 6

6. 1187

7. 12

8.

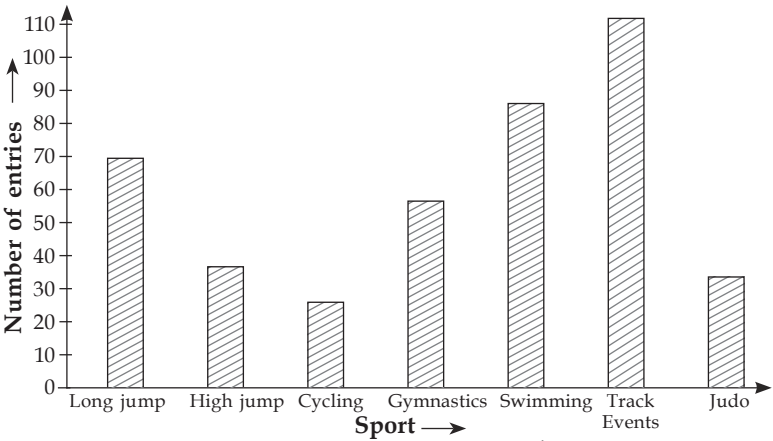


9.

☺ = 30 teachers

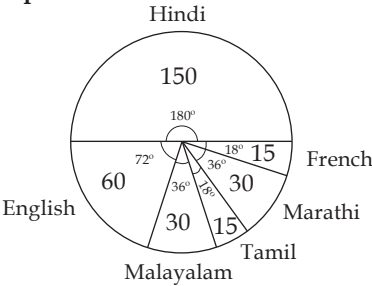
Zone	Number of teachers
East	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
West	☺ ☺ ☺ ☺ ☺ ☺
South	☺ ☺ ☺ ☺ ☺ ☺ ☺
North	☺ ☺ ☺ ☺
Central	☺ ☺ ☺ ☺ ☺

10.



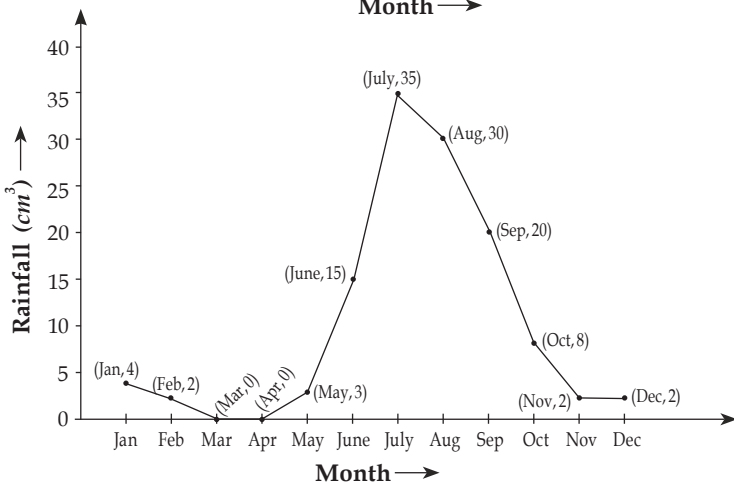
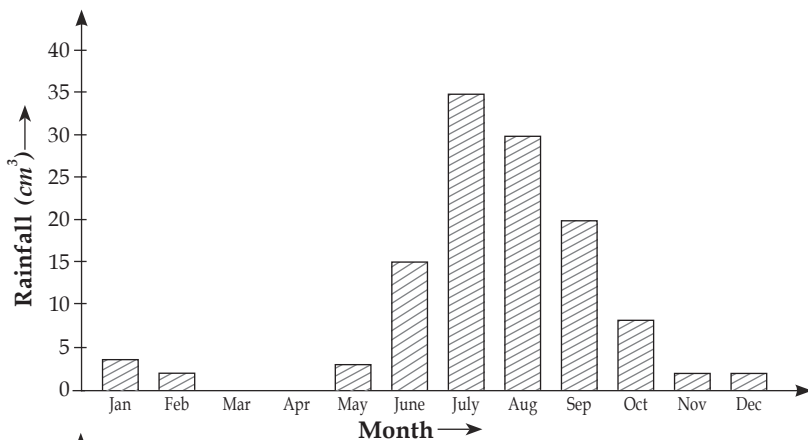
11.

Language	Sector angle
Hindi	180°
English	72°
Malayalam	36°
Tamil	18°
Marathi	36°
French	18°



12. (a) ₹45000 (b) ₹3000 (c) ₹8000 (d) ₹10000

13.



14. (a) $\frac{1}{5}$ (b) $\frac{4}{25}$ (c) $\frac{3}{10}$ (d) $\frac{19}{25}$
 15. (a) $\frac{4}{15}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{11}{15}$
 16. (a) $\frac{29}{50}$ (b) $\frac{59}{100}$ (c) 0 (d) $\frac{19}{50}$

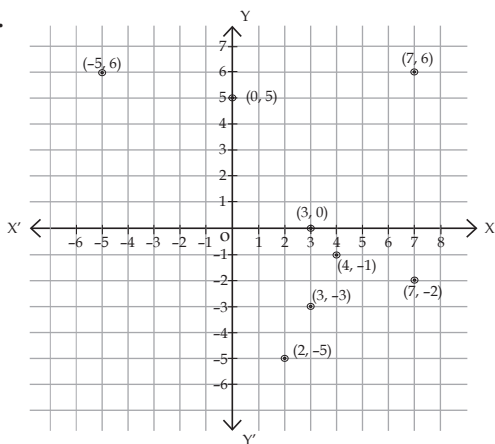
Chapter 17

Cartesian System and Coordinates

Exercise 17.1

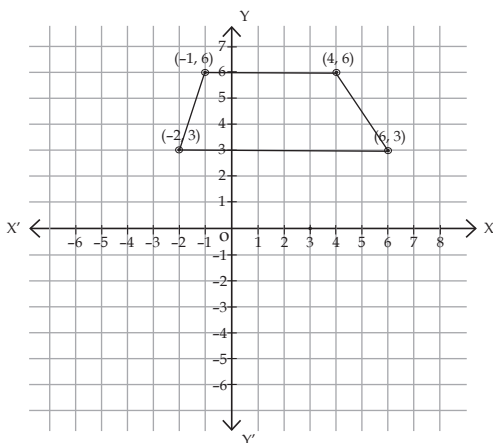
1. (a) 4 (b) - , - (c) -4 (d) -6

2.



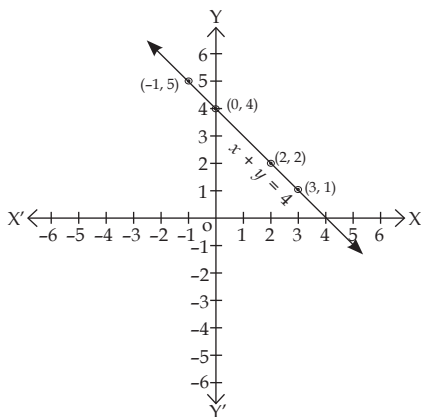
3. A (4, 2)
 B (-1, 4)
 C (-2, -3)
 D (3, -2)
 E (3, 5)
 F (-4, 0)
 G (0, -2)
 H (2, -4)

4. Trapezium



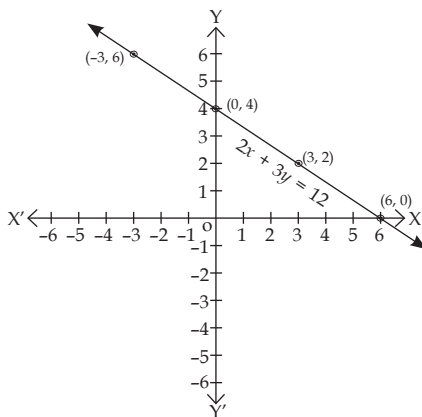
5. (a)

x	0	-1	2	3
y	4	5	2	1



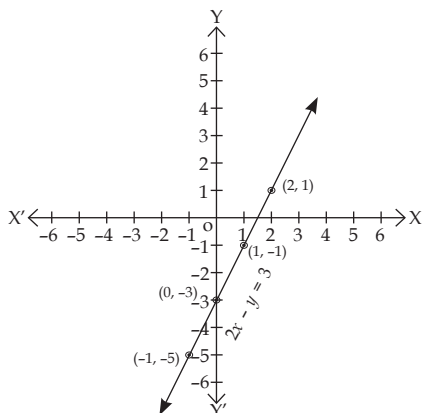
(b)

x	0	3	6	-3
y	4	2	0	6



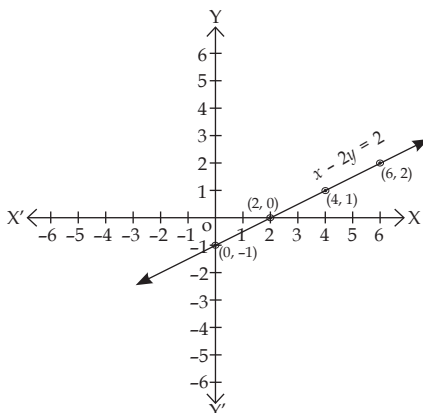
(c)

x	0	1	-1	2
y	-3	-1	-5	1



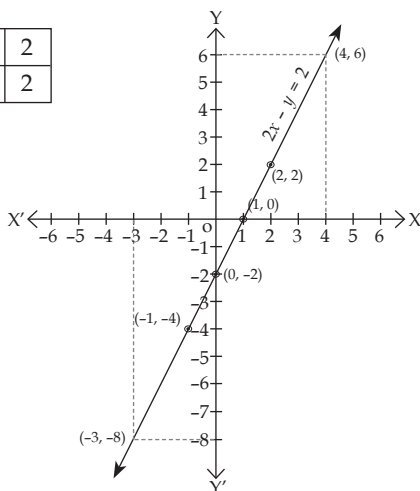
(d)

x	0	2	4	6
y	-1	0	1	2



6.

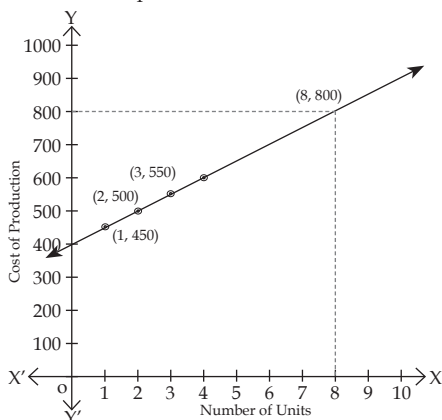
x	0	1	-1	2
y	-2	0	-4	2



Exercise 17.2

1.

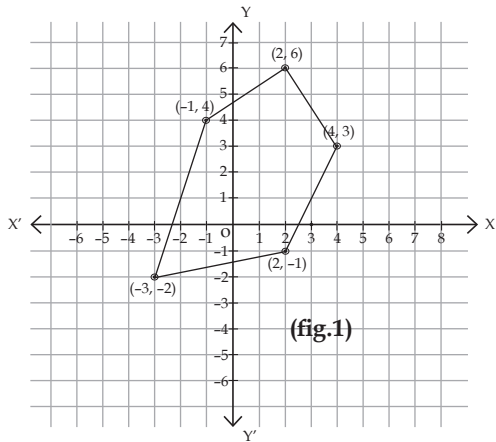
x	1	2	3	4
y	450	500	550	600



2. (a) 55 km/hr
(b) 60 Km
(c) 90 Km

Revision Exercise

- 1. (a) 3, -5
 - (b) line
 - (c) III
 - (d) Y-axis
2. Pentagon



(fig.1)

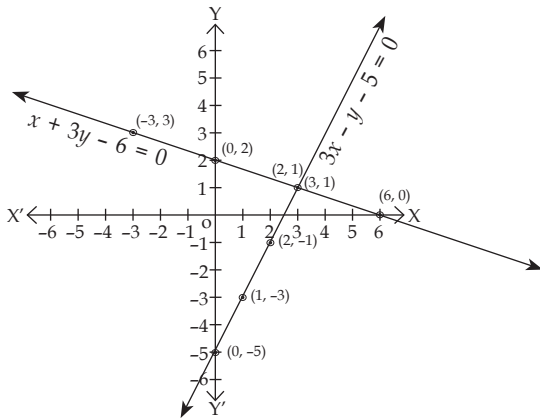
3. (3, 1)

$x + 3y - 6 = 0$

x	0	3	6	-3
y	2	1	0	3

$2x - y - 5 = 0$

x	0	1	2	3
y	-5	-3	-1	1



- | | | | |
|---------------|------------|-------------|------------|
| 4. A (-3, 3), | B (4, -5), | C (-1, -3), | D (3, 3) |
| E (0, 2), | F (5, 0), | G (2, -2) | H (-5, -4) |

Chapter 18

Formulae & Equations

Exercise 18.1

- 1. (a) $y = 2x + 5$, Where Rajeev's age = x , Rohit's age = y
 - (b) $\frac{x}{y} = \frac{18}{7}$, Where salary = x , Saving = y
 - (c) $E = \frac{1}{2}mv^2$, Where Energy = E , Mass = m , Velocity = v
 - (d) $SP = MP - 150$
2. 1950
3. $10y + x = 5(x + y) + 4$, Where ten's digits = y , unit's digits = x
4. $10y + x - 18 = 10x + y$, where ten's digits = y , unit's digits = x
5. $A = 100y + 50(x - y)$, A = amount
6. (a) 6600 (b) $T = \frac{(A - P) \times 100}{PR}, 8$

Exercise 18.2

- (a) $x = 1, y = -3$ (b) $x = 1, y = 1$
(c) $x = -2, y = 1$ (d) $x = 2, y = 3$
- (a) $x = 3, y = 4$ (b) $x = 2, y = -3$
(c) $x = 3, y = 4$ (d) $x = -2, y = -1$
- (a) $\frac{12}{25}$ 4. ₹360 5. $l = 33\text{ cm}, b = 11\text{ cm}$
- 12° and 168° 7. $l = 21\text{ m}, b = 10\text{ m}$
- 11, 53 9. 10 and 6 10. 83
12. Starting salary = ₹13000, Increment = ₹3000

Exercise 18.3

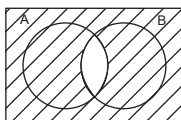
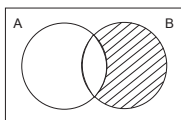
- (a) and (b)
- (a) $x = 2$ is a solution but $x = 6$ is not
(b) $x = -9$ & $x = -4$ are solution
- (a) $\frac{-3}{5}, 1$ (b) 12, -2 (c) $\frac{4}{3}, 3$ (d) $\frac{4}{9}, 2$
- 12 and 13 5. Kumble = 5, Kapil = 3
- 16 7. 12 and 6 8. 53
- 7 and 8 10. Base = 12 cm, altitude = 5 cm
- 11 and 12 12. 36 and 9

CHAPTER 19

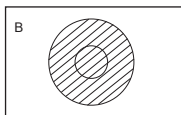
Set Theory

Exercise 19.1

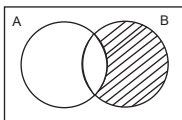
- (a) {30, 40, 50, 60, 70, 80}
(b) {101, 108, 115, 122, 129, 136, 143, 150, 157, 164, 171, 178, 185, 192, 199}
(c) {M, I, S, P} (d) {January, June, July}
- (a) $\{x^3 : x \in \mathbb{N}, x \leq 10\}$ (b) $\{x : x \in \mathbb{Z}, -3 \leq x \leq 5\}$
(c) $\{x : x \text{ is a vowel in English alphabet}\}$ (d) $\left\{\frac{x}{x+1} : x \in \mathbb{N}, x \neq 6\right\}$
- Subsets of $A = \phi, \{1\}, \{2\}, \{3\}, \{4\}, \{1, 2\}, \{1, 3\}, \{1, 4\}, \{2, 3\}, \{2, 4\}, \{3, 4\}, \{1, 2, 3\}, \{1, 2, 4\}, \{1, 3, 4\}, \{2, 3, 4\}, \{1, 2, 3, 4\}$
- (a) $A \cup B = \{2, 3, 4, 5, 6\}$ (b) $B \cap C = \{4\}$
(c) $A \cup (B \cap C) = \{2, 4, 5, 6\}$ (d) $(A \cap B) \cup C = \{1, 2, 4, 5, 7\}$
(e) $A' \cap B' = \{1, 7\}$ (f) $A \cap (B \cup C)' = \{6\}$
(g) $A' \cup (B \cap C)' = \{1, 2, 3, 5, 6, 7\}$ (h) $A - B = \{2, 6\}$
(i) $C - A = \{1, 7\}$ (j) $(B - A) \cup (A - C) = \{3, 5, 6\}$
- (a) $B - A$ (b) $(A \cap B)'$



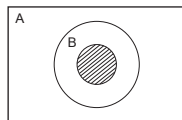
(c) $A \cup B, A \subset B$



(d) $A' \cap B$



(e) $A \cap B, B \subset A$



6. (a) 16

(b) 27

(c) 22

7. (a) 350

(b) 110

Exercise 19.2

1. $x = \frac{-16}{3}, y = 8$

(b) $x = \frac{7}{2}, y = \frac{-23}{12}$

2. (a) $A \times B = \{(m, 2), (m, 3), (m, 5), (m, 7), (n, 2),$

$(n, 3), (n, 5), (n, 7), (p, 2), (p, 3), (p, 5), (p, 7)\}$

(b) $B \times A = \{(2, m), (2, n), (2, p), (3, m), (3, n), (3, p)$

$(5, m), (5, n), (5, p), (7, m), (7, n), (7, p)\}$

3. (a) $R = \{(1, 3), (2, 4), (3, 5), (4, 6), (5, 7), (6, 8)\}$

(b) Domain of $R = \{1, 2, 3, 4, 5, 6\}$

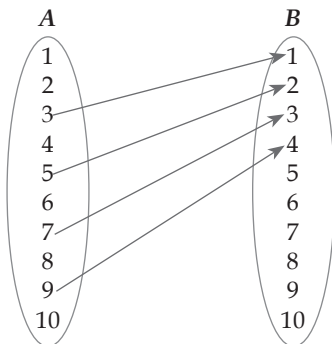
Codomain of $R = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

Range of $R = \{3, 4, 5, 6, 7, 8\}$

4. (a) $R = \{(3, 1), (5, 2), (7, 3), (9, 4)\}$

$= \{(a, b) : a \in A, b \in B, a = 2b + 1\}$

(b)



(c) Domain of $R = \{3, 5, 7, 9\}$

Range of $R = \{1, 2, 3, 4\}$

5. Domain of $f =$ set of all natural numbers

Range of $f =$ set of all even natural numbers

6. (a) -17

(b) 31

(c) $\frac{-1}{2}$

(d) 9

Exercise 20.1

- 12 cm
- (a) $x = 60, y = 90$ (b) $x = 35, y = 45$
(c) $x = 30, y = 60, z = 30$
- (a) $\widehat{AB}, \widehat{CD}$ (b) BOA (c) AXB
- (a) $m(\text{minor } \widehat{AB}) = 80^\circ$
(b) $m \widehat{ABC} = 150^\circ$
(c) $m(\text{major } \widehat{AB}) = 280^\circ$
- (a) $(-3, 6)$ (b) $(3, -6)$
(c) $(3, -6)$ (d) $(-3, -6)$
- A $(-4, -5)$, B $(-8, -2)$, C $(-4, 3)$, D $(6, 2)$, E $(3, -4)$

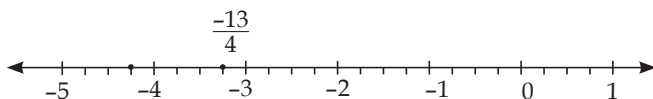
SAMPLE PAPER**SA I****Section A**

- | | | | |
|--------|---------|--------|--------|
| 1. (b) | 2. (a) | 3. (d) | 4. (c) |
| 5. (a) | 6. (a) | 7. (d) | 8. (c) |
| 9. (d) | 10. (b) | | |

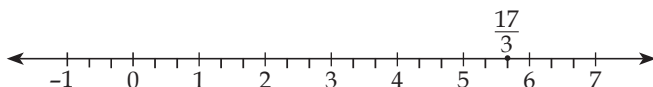
Section B

11. $(5x + 12y)(3x^2 - 2y)$

12. (a)



(b)



13. We can't cancel 3 in numerator with 6 in denominator

$$\frac{3(x^2 - 4) + 7}{6} = \frac{3x^2 - 12 + 7}{6} = \frac{3x^2 - 5}{6}$$

14. Mass of proton approx. 1836 times more than that of electron.

15. $8\frac{1}{8}$ cm

Section C

16. 6, 252

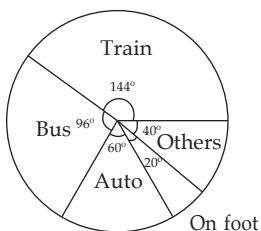
17. (a) 1295029 (b) 6351

18. $\frac{35}{8}, \frac{19}{4}, \frac{41}{8}$

25. $\frac{-6}{11}$ 26. $x + 2$ 27. $\frac{5}{8}$

33. (a) 180 (b) $108x^2y + 16y^3$

19.



20. ₹ 25000

21. 58%

22. $y = -3$

23. 13 Days

25. Area = 384 cm^2 , perimeter = 80 cm

26. 42.6 years

27. 600 cm^2

Section D

28. 4150 m^2

29. ₹ 7500

30. (a) 40°

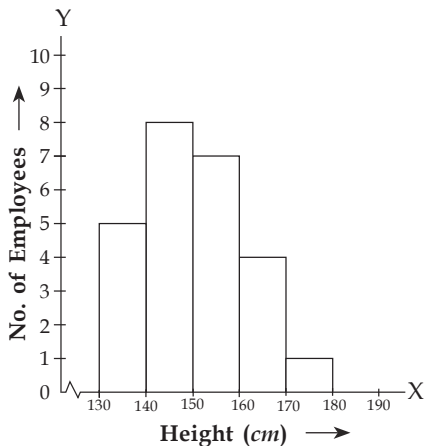
(b) 40°

(c) 40°

(d) 65°

31.

Height (cm)	Tally Marks	Frequency
130-140		5
140-150		8
150-160		7
160-170		4
170-180		1
Total		25



32. ₹ 90970.25, ₹ 1270.25

33. (a) 6336 cm^3 (b) 6336 cm^2

Mental Ability Test

1. 4

2. 31

3. 2

4. 31

5. 2

6. 16

7. 23, 30, 32

8. 12, 13, 14

9. 15, 24, 31

10. 62

11. HDIYRZGG

12. Mother

13. Daughter

14. Brother-in-law

15. Three

16. East

17. D is third to the left of E

18. 46650

19. 18

20. 2