Chapter 1 Whole numbers

Level 1

Exercise 1

1. (a) One million, seven hundred and thirty-four thousand, eight hundred and twelve
   (b) Five million, nine hundred and twenty-three thousand, six hundred and seventy-three
   (c) Four million, five hundred and nine thousand, six hundred and sixty
   (d) Seven million, eighty-one thousand and forty-six
2. (a) 5 639 174 (b) 8 463 510
   (c) 4 013 042 (d) 1 900 650
3. (a) 9 (b) 60 000
   (c) ten thousands (d) thousands
4. (a) 400 000 (b) 265
   (c) 8 061 420 (d) 6 900 030
5. (a) 501 647, 504 617, 540 761
   (b) 9 080 899, 9 088 900, 9 908 009
6. (a) 174 538, 143 875, 53 741
   (b) 3 040 034, 443 003, 344 340
7. (a) 625 197 (−10 000) 615 197 (−10 000) 605 197 (−10 000) **595 197** (−10 000) **585 197**
   (b) **6 710 800** (−1 100 000) **5 610 800** (−1 100 000) 4 510 800, (−1 100 000) 3 410 800 (−1 100 000) 2 310 800
8. (a) $4750 + 2512 \approx 4800 + 2500 = 7300$
   (b) $1822 - 689 \approx 1800 - 700 = 1100$
   (c) $8543 + 7651 + 3485 \approx 8500 + 7700 + 3500 = 19\,700$
   (d) $9844 - 3245 - 1460 \approx 9800 - 3200 - 1500 = 5100$
9. (a) $3280 + 1754 \approx 3000 + 2000 = 5000$
   (b) $8951 - 7108 \approx 9000 - 7000 = 2000$
   (c) $2704 + 6700 + 3819 \approx 3000 + 7000 + 4000 = 14\,000$
   (d) $9300 - 5260 - 1508 \approx 9000 - 5000 - 2000 = 2000$
10. (a) $2609 \times 4 \approx 3000 \times 4 = 12\,000$
    (b) $7099 \times 5 \approx 7000 \times 5 = 35\,000$
    (c) $4530 \times 9 \approx 5000 \times 9 = 45\,000$
    (d) $5621 \times 8 \approx 6000 \times 8 = 48\,000$
11. (a) $4457 \div 5 \approx 4500 \div 5 = 900$
    (b) $2381 \div 3 \approx 2400 \div 3 = 800$
    (c) $4901 \div 7 \approx 4900 \div 7 = 700$
    (d) $3023 \div 6 \approx 3000 \div 6 = 500$
12. (a) $13 \times 50 = 13 \times 5 \times 10 = 65 \times 10 = 650$
    (b) $4030 \times 70 = 4030 \times 7 \times 10 = 28\,210 \times 10 = 282\,100$
    (c) $811 \times 900 = 811 \times 9 \times 100 = 7299 \times 100 = 729\,900$
    (d) $407 \times 5000 = 407 \times 5 \times 1000 = 2035 \times 1000 = 2\,035\,000$
13. (a) $60 \div 20 = 60 \div 10 \div 2 = 6 \div 2 = 3$
    (b) $1440 \div 60 = 1440 \div 10 \div 6 = 144 \div 6 = 24$
    (c) $20\,000 \div 5000 = 20\,000 \div 1000 \div 5 = 20 \div 5 = 4$
    (d) $108\,000 \div 9000 = 108\,000 \div 1000 \div 9 = 108 \div 9 = 12$
14. (a) 7 (b) 89
    (c) 62 (d) 71
15. (a) $65 - 29 + 9 - 45 = 36 + 9 - 45 = 45 - 45 = 0$

(b) $14 \times 9 \div 3 \div 7 = 126 \div 3 \div 7$
$= 42 \div 7$
$= \mathbf{6}$

(c) $12 \times (5 - 2) = 12 \times 3$
$= \mathbf{36}$

(d) $30 + (28 - 8) \div 5 \times 4 = 30 + 20 \div 5 \times 4$
$= 30 + 4 \times 4$
$= 30 + 16$
$= \mathbf{46}$

Exercise 2

1. $2677 \approx 3000$
$3000 \div 12 = \mathbf{250}$
2. $492\ \ell \times 87 \approx 500\ \ell \times 90 = \mathbf{45\ 000\ \ell}$
*3. Total number of pupils
→ 1030 + 1098
= 2128
Number of classes
→ 2128 ÷ 38
= **56**
4. Amount received from the sale of first 45 melons
→ 45 × $6
= $270
Number of remaining melons
→ 100 – 45
= 55
Amount received from the sale of the remaining 55 melons
→ 55 × $5
= $275
Amount received from the sale of all the melons
→ $275 + $270
= **$545**
5. 3 parts → $4526 – $800
= $3726
1 part → $3726 ÷ 3
= $1242
He gave **$1242** to his wife.
6. Amount paid for children
→ $450 × 2
= $900
Amount paid for adults
→ $700 × 3
= $2100
Total amount paid
→ $900 + $2100
= **$3000**
7. Cost of 2 plates of rice
→ $8 × 2
= $16
Cost of 3 plates of noodles
→ $5 × 3
= $15
Amount Mr Chow had at first
→ $16 + $15 + $29
= **$60**
8. 3928 – 1750 = 2178
2178 + 817 = 2995
He has **2995** points now.
9. Perimeter of field → 100 m × 4
= 400 m
Length of 3 rounds → 400 m × 3
= 1200 m
Time taken to jog 1200 m → 1200 ÷ 80
= **15 min**
*10. Total number of oranges
→ 128 × 25
= 3200
Number of bags of oranges
→ 3200 ÷ 8
= 400
Amount collected after selling all the oranges
→ 400 × $3
= **$1200**
*11. Length of carpet → 31 m – 2 m
= 29 m
Breadth of carpet → 18 m – 2 m
= 16 m
Area of carpet → 29 m × 16 m
= 464 m^2
Cost of carpet → $21 × 464
= **$9744**
*12. Number of chairs in the first 10 rows
→ 10 × 42
= 420
Number of remaining rows
→ 35 – 10
= 25
Number of chairs in the remaining 25 rows
→ 25 × 56
= 1400
Total number of chairs
→ 420 + 1400
= **1820**

*13. Number of sets of 25 bookmarks
→ 200 ÷ 25
= 8
Cost of 8 sets of bookmarks
→ $8 × 8
= $64
Number of sets of 4 bookmarks
→ 200 ÷ 4
= 50
Amount received from sale of the bookmarks
→ $2 × 50
= $100
Profit → $100 – $64
= **$36**

*14. Perimeter of field → 40 m × 2 + 34 m × 2
= 148 m
Cost to fence the field → 148 × $24
= **$3552**

*15. Number of months in 7 years
→ 7 × 12
= 84
Amount paid in instalments
→ $880 × 84
= $73 920
Cost of the car
→ $73 920 + $10 000
= **$83 920**

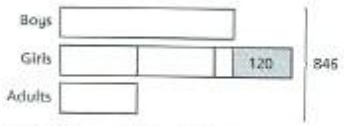
Level 2

Exercise 1

1.

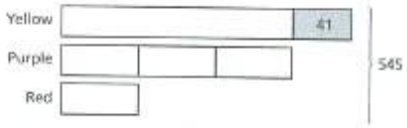
3 units → 119 – 2 – 3
= 114
Number of pupils in 5C → 114 ÷ 3
= 38
Number of pupils in 5B → 38 + 2
= 40
Total number of pupils in 5B and 5C
→ 40 + 38
= **78**

2.



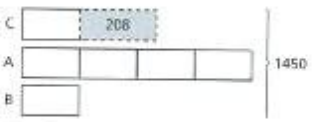
7 units → 846 + 120
= 966
Number of adults → 966 ÷ 7
= 138
Number of girls → 138 × 3
= 414
Number of boys → 414 – 120
= 294
Difference between the number of boys and the number of adults
→ 294 – 138
= **156**

3.



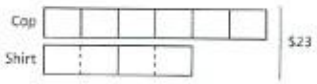
7 units → 545 – 41
= 504
Number of red marbles → 504 ÷ 7
= 72
Number of purple marbles → 72 × 3
= 216
Number of yellow marbles → 216 + 41
= 257
Difference in number of red and yellow marbles
→ 257 – 72
= **185**

4.



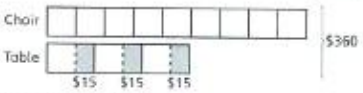
6 units → 1450 – 208
= 1242
Number of beads in Box B → 1242 ÷ 6
= 207
Number of beads in Box A → 207 × 4
= 828
Number of beads in Box C → 207 + 208
= 415
Difference in number of beads between Box A and Box C
→ 828 – 415
= **413**

5.



10 units → $23
Cost of 1 cap → $23 ÷ 10
= $2.30
Cost of 1 shirt → $2.30 × 2 = $4.60
Cost of 1 cap and 1 shirt → $2.30 + $4.60
= **$6.90**

*6.



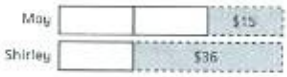
$15 × 3 = $45
12 units → $360 − $45
= $315
Cost of 1 chair → $315 ÷ 12
= $26.25
Cost of 2 chairs → $26.25 × 2
= **$52.50**

7. 5 units → $100
Amount of money Kenneth's brother has
→ 1 unit
→ $100 ÷ 5
= $20
Difference in amount of money between Kenneth and his brother
→ 3 units
→ $20 × 3
= $60
Amount of money Kenneth must give to his brother
→ $60 ÷ 2
= **$30**

8. Total number of marbles → 60 + 9
= 69
3 units → 69
1 unit → 69 ÷ 3 = 23
Wee Ming has 23 marbles after receiving some from Boon Yeow.
Number of marbles Boon Yeow must give
= Number of marbles Wee Ming receives
= 23 − 9
= **14**

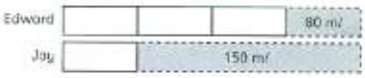
9. Amount of money Mrs Kam has at first
→ $1200 − $520
= $680
Total amount of money
→ $1200 + $680
= $1880
$1880 − $100 = $1780
2 units → $1780
1 unit → $1780 ÷ 2
= $890
Mrs Kam has $890 after receiving some money from Mr Kam.
Amount of money Mr Kam gave
= Amount of money Mrs Kam received
= $890 − $680
= **$210**

10.



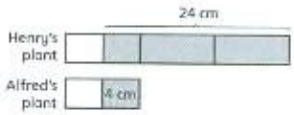
1 unit → $36 − $15
= $21
Shirley had $21 in the end.
2 units → $21 × 2
= $42
May had $42 in the end.
Amount of money they had at first
→ $21 + $36 + $42 + $15
= **$114**

11.



2 units → 150 m/ − 80 m/
= 70 m/
1 unit → 70 m/ ÷ 2
= 35 m/
Jay had 35 m/ of water in the end.
3 units → 35 m/ × 3
= 105 m/
Edward had 105 m/ of water in the end.
Amount of water Jay had at first
= 35 m/ + 150 m/
= 185 m/
Check: Amount of water Edward had at first
= 105 m/ + 80 m/
= 185 m/
Each of them had **185 m/** of water at first.

12.



2 units → 24 cm – 4 cm
= 20 cm
1 unit → 20 cm ÷ 2
= 10 cm
The height of Alfred's plant in the end is 10 cm.
3 units → 10 cm × 3
= 30 cm
The height of Henry's plant in the end is 30 cm.
Height of Henry's plant at first
→ 30 cm – 24 cm
= **6 cm**

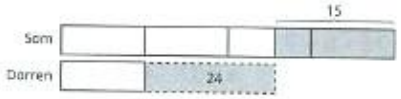
13.

3 units → 27 – 3
= 24
1 unit → 24 ÷ 3
= 8
Mdm Gwee's CCA had 8 pupils in the end.
4 units → 8 × 4
= 32
Mrs Lee's CCA had **32 pupils** in the end.
Check: At first, Mrs Lee's CCA = 32 – 27
= 5
Mdm Gwee's CCA = 8 – 3
= 5

14.

1 unit → $1600 + $750
= $2350
Jeremy had $2350 in the end.
2 units → $2350 × 2
= $4700
Heng Yi had $4700 in the end.
Amount of money Jeremy had at first
→ $2350 + $750
= $3100
Amount of money Heng Yi had at first
→ $4700 – $1600
= $3100
Each of them had **$3100** at first.

15.



3 units → 24 + 15
= 39
1 unit → 39 ÷ 3
= 13
Darren had 13 cards in the end.
4 units → 13 × 4
= 52
Sam had 52 cards in the end.
Number of cards Darren had at first
→ 13 + 24
= 37
Number of cards Sam had at first
→ 52 – 15
= 37
Each of them had **37 cards** at first.

Exercise 2

1. **(3)**
30 ten thousands + 30 hundreds + 3 tens
= 300 000 + 3000 + 30
= 303 030
2. **(3)**
990 909 is nine hundred and ninety thousand, nine hundred and nine written in numerals.
3. **(3)**
1 million = 1 000 000
1 000 000 ÷ 100 = 10 000
4. **(2)**
500 000 + 40 + 7 = 500 047
512 047 – 500 047 = 12 000
5. **(3)**
300 000 ÷ 20 = 15 000
6. **(1)**
429 × 9 = 3861
3861 = 4000 (nearest thousand)
7. **(3)**
720 445 is seven hundred and twenty thousand, four hundred and forty-five written in numerals.
8. **(4)**
769 = 800 (nearest hundred)
27 = 30 (nearest ten)
9. **(2)**
58 × 90 = 5220
58 × 9 × 10 = 5220

10. **(1)**
$102 - 24 \div 6 + 7 \times 2 = 102 - 4 + 7 \times 2$
$= 102 - 4 + 14$
$= 98 + 14$
$= 112$

11. **(3)**
$(8 + 8) \times 7 - 4 = 16 \times 7 - 4$
$= 112 - 4$
$= 108$

12. **(1)**
The value of the digit in the millions place is 9 000 000.
The value of the digit in the hundreds place is 900.
9 000 000 ÷ 900 = 10 000

13. **(3)**
100 ÷ 6 = 16 R 4
16 + 1 = 17

14. **(4)**
$2 \times 9 + 4 = 22$
$6 \times 5 + 3 = 33$
$11 \times \square + 2 = 46$
$11 \times \square = 44$
$\square = 4$

15. **(1)**
$30 - 1 = 29$
$29 \times 10 = 290$

Level 3

Exercise 1

1. **984 857**
Since the number is between 980 000 and 990 000, the digit in the hundred thousands place is 9 and the digit in the ten thousands place is 8.
Factors of 10: 1, 2, 5, 10.
Since the digit in the tens place is not 1, is an odd number and is a factor of 10, it is 5.
9 – 2 = 7
The digit in the ones place is 7.
The digit in the hundreds place is 8.
The digit in the thousands place is 4.

2. **4 380 817**
Since the number is between 4 000 000 and 5 000 00, the digit in the millions place is 4.
The digit in the hundreds place is 8.
Factors of 4: 1, 2, 4.
1 + 2 + 4 = 7
The digit in the ones place is 7.
4 – 1 = 3
The digit in the hundred thousands place is 3.
The digit in the ten thousands place is 8.
The digit in the thousands place is 0.
8 – 7 = 1
The digit in the tens place is 1.

3.

7	×	6	+	5	=	47
−		+		−		
8	+	4	−	1	=	1
+		×		×		
2	+	9	+	3	=	5
=		=		=		
3		42		2		

4.

9	×	4	+	2	=	18
+		+		×		
8	+	6	×	5	=	38
−		+		−		
7	+	3	+	1	=	10
=		=		=		
10		6		9		

5. W = 1 ; Y is any number from 0 to 9 ; Z = 0
6. A = 8 ; B = 9
7. Difference in number of cards between Paul and Gary
→ 25 – 18
= 7
Total number of cards of Paul and Gary = 17
Gary → (17 – 7) ÷ 2
= 5
Paul → 5 + 7
= 12
Simon → 25 – 12
= 13
Total → 5 + 12 + 13
= **30**
8. Difference in mass between son and daughter
→ 100 kg – 70 kg
= 30 kg
2 units → 30 kg
Daughter → 1 unit
→ 30 kg ÷ 2
= 15 kg
Son → 3 units
→ 15 kg × 3
= 45 kg
Mrs Tan → 100 kg – 45 kg = **55 kg** OR
Mrs Tan → 70 kg – 15 kg = **55 kg**

9. Difference in marks between Science and Mathematics tests
→ 167 – 95
= 72
3 units → 72
Mathematics → 1 unit
→ 72 ÷ 3
= **24**
Science → 4 units
→ 24 × 4
= **96**
English → 95 – 24 = **71** OR
English → 167 – 96 = **71**

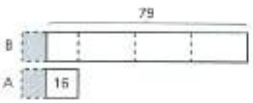
10.

1 unit → $15 – $6
= $9
Amount of money parents gave to each of them
→ $9 – $6
= **$3**

11.

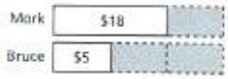
2 units → 62 litres – 10 litres
= 52 litres
1 unit → 52 litres ÷ 2
= 26 litres
Amount of water poured into each of the containers
→ 26 litres – 10 litres
= **16 litres**

12.



3 units → 79 – 16
= 63
1 unit → 63 ÷ 3
= 21
Group A had **21** points in the end.
4 units → 21 × 4
= 84
Group B had **84** points in the end.

13.

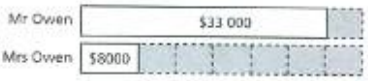


1 unit → $18 – $5
= $13
Amount of money Mark had at first
→ $18 + $13
= $31
Each of them had **$31** at first.

14.

2 units → 350 ml – 50 ml
= 300 ml
1 unit → 300 ml ÷ 2
= 150 ml
Amount of water Patricia had at first
→ 350 ml + 150 ml
= 500 ml
Each of them had **500 ml** of water at first.

15.



5 units → $33 000 – $8000
= $25 000
1 unit → $25 000 ÷ 5
= $5000
Amount of money Mr Owen have at first
→ $33 000 + $5000
= $38 000
Each of them had **$38 000** at first.

Exercise 2

1. Difference in age → 39 – 9
= 30
2 units → 30
Age of Wallace when Mr Lim is 3 times as old as him
→ 1 unit
→ 30 ÷ 2
= 15
Age of Mr Lim when he is 3 times as old as Wallace
→ 3 units
= 15 × 3
= **45**

2. Age of Mr James three years from now
→ 39 + 3
= 42
Age of Mr James' daughter three years from now
→ 42 ÷ 6
= 7
Age of his daughter now
→ 7 – 3
= **4**

3. Age of son in 4 years' time = 29
Age of Mdm Umairah in 4 years' time
→ 29 × 2
= 58
Age of son now
→ 29 – 4
= **25**
Age of Mdm Umairah now
→ 58 – 4
= **54**

4. Difference in age → 43 – 11
= 32
2 units → 32
1 unit → 32 ÷ 2
= 16
16 – 11 = **5**

5. Difference in age → 51
3 units → 51
1 unit → 51 ÷ 3
= 17
17 – 8 = **9**

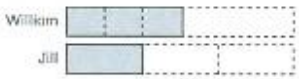
6. Difference in age → 30 – 18
= 12
1 unit → 12
18 – 12 = **6**

7. Difference in age → 76 – 13
= 63
7 units → 63
1 unit → 63 ÷ 7
= 9
13 – 9 = **4**

8. Sum of their age 2 years ago
→ 32 – 2 – 2 – 2 – 2
= 24
4 units → 24
Age of her sister 2 years ago
→ 1 unit
→ 24 ÷ 4
= 6
Age of Ms Wati 2 years ago
→ 3 units
→ 6 × 3
= 18
Age of Ms Wati now
→ 18 + 2
= **20**

9. Sum of their age 6 years from now
→ 44 + 6 + 6
= 56
4 units → 56
Age of her son 6 years from now
→ 1 unit
→ 56 ÷ 4
= 14
Age of Mdm Fauziah 6 years from now
→ 3 units
→ 14 × 3
= 42
Age of Mdm Fauziah now
→ 42 – 6
= **36**

10. Sum of their age 14 years from 2006
→ 47 + 14 + 14
= 75
3 units → 75
Age of Eugene 14 years from 2006
→ 1 unit
→ 75 ÷ 3
= 25
Age of Eugene in 2006
= 25 – 14
= **11**

11. 

1 unit → 17 kg
William → 17 kg × 3
= 51 kg
Jill → 17 kg × 2
= 34 kg
Total mass → 51 kg + 34 kg
= **85 kg**

12.

4 units → \$2100
1 unit → \$2100 ÷ 4
= \$525
3 units → \$525 × 3
= **\$1575**

*13. (a) (6 × 4) + 2 = **26**
(b) (6 × 15) + 2 = **92**

*14. (a) 1 + 2 + 3 + 4 + 5 = **15**
(b) 1 + 2 + 3 + 4 + 5 + 6 + 7 = 28
Figure 7 will need 28 squares.
(c) 1 + 2 + ... + 13 + 14
= 7 × 15 (7 sets of 15)
= **105**

*15. (a) Figure 2 → 5 squares
Figure 3 → 5 + 3 = 8 squares
Figure 4 → 5 + 3 + 3 = 11 squares
Figure 5 → 5 + 3 + 3 + 3 = 14 squares
Figure 6 → 5 + 3 + 3 + 3 + 3 = **17** squares
(b) **Figure 10**
(29 − 5) ÷ 3 = 8
2 + 8 = 10
(c) Figure 20 → 5 + (3 × 18) = **59**

Chapter 2 Fractions 1

Level 1

Exercise 1

1. (a) $\frac{1}{5} + \frac{1}{4} = \frac{4}{20} + \frac{5}{20}$
$= \frac{9}{20}$

(b) $\frac{3}{7} + \frac{1}{4} = \frac{12}{28} + \frac{7}{28}$
$= \frac{19}{28}$

(c) $\frac{1}{6} + \frac{4}{9} = \frac{9}{54} + \frac{24}{54}$
$= \frac{33}{54}$
$= \frac{11}{18}$

(d) $\frac{1}{8} + \frac{5}{6} = \frac{6}{48} + \frac{40}{48}$
$= \frac{46}{48}$
$= \frac{23}{24}$

2. (a) $\frac{2}{3} - \frac{5}{12} = \frac{8}{12} - \frac{5}{12}$
$= \frac{3}{12}$
$= \frac{1}{4}$

(b) $\frac{3}{7} - \frac{1}{6} = \frac{18}{42} - \frac{7}{42}$
$= \frac{11}{42}$

(c) $\frac{9}{10} - \frac{3}{4} = \frac{36}{40} - \frac{30}{40}$
$= \frac{6}{40}$
$= \frac{3}{20}$

(d) $\frac{7}{12} - \frac{3}{8} = \frac{56}{96} - \frac{36}{96}$
$= \frac{20}{96}$
$= \frac{5}{24}$

3. (a) $\frac{1}{8} = \boxed{1} \div \boxed{8}$ (b) $\frac{5}{7} = \boxed{5} \div \boxed{7}$
(c) $\frac{8}{9} = \boxed{8} \div \boxed{9}$ (d) $\frac{12}{5} = \boxed{12} \div \boxed{5}$

4. (a) $\frac{5}{6}$ (b) $\frac{4}{7}$
(c) $\frac{8}{12} = \frac{2}{3}$ (d) $\frac{21}{9} = 2\frac{1}{3}$

5. (a) 0.4 (b) 0.125
(c) 0.45 (d) 0.75

6. (a) 0.33 (b) 0.89
(c) 0.43 (d) 0.83

7. (a) 4.25 (b) 1.22
(c) 2.38 (d) 5.14

8. (a) $1\frac{2}{3} + 1\frac{2}{5} = 1\frac{10}{15} + 1\frac{6}{15}$
$= 2\frac{16}{15}$
$= 3\frac{1}{15}$

(b) $5\frac{4}{7} + \frac{3}{5} = 5\frac{20}{35} + \frac{21}{35}$
$= 5\frac{41}{35}$
$= 6\frac{6}{35}$

(c) $4\frac{1}{12} + 1\frac{7}{8} = 4\frac{8}{96} + 1\frac{84}{96}$
$= 5\frac{92}{96}$
$= 5\frac{23}{24}$

(d) $1\frac{7}{9} + 6\frac{1}{3} = 1\frac{7}{9} + 6\frac{3}{9}$
$= 7\frac{10}{9}$
$= 8\frac{1}{9}$

9. (a) $3\frac{5}{6} - 1\frac{1}{10} = 3\frac{50}{60} - 1\frac{6}{60}$
$= 2\frac{44}{60}$
$= 2\frac{11}{15}$

(b) $2\frac{5}{12} - 1\frac{3}{4} = 2\frac{5}{12} - 1\frac{9}{12}$
$= 1\frac{17}{12} - 1\frac{9}{12}$
$= \frac{8}{12}$
$= \frac{2}{3}$

(c) $7\frac{1}{8} - 2\frac{1}{5} = 7\frac{5}{40} - 2\frac{8}{40}$
$= 6\frac{45}{40} - 2\frac{8}{40}$
$= \mathbf{4\frac{37}{40}}$

(d) $8\frac{2}{3} - 4\frac{1}{7} = 8\frac{14}{21} - 4\frac{3}{21}$
$= \mathbf{4\frac{11}{21}}$

10. (a) $2\frac{1}{5} - 1\frac{2}{9} = 2\frac{9}{45} - 1\frac{10}{45}$
$= 1\frac{54}{45} - 1\frac{10}{45}$
$= \mathbf{\frac{44}{45}}$

(b) $4\frac{1}{4} + 1\frac{5}{8} = 4\frac{2}{8} + 1\frac{5}{8}$
$= \mathbf{5\frac{7}{8}}$

(c) $3\frac{1}{2} + 2\frac{1}{6} = 3\frac{3}{6} + 2\frac{1}{6}$
$= 5\frac{4}{6}$
$= \mathbf{5\frac{2}{3}}$

(d) $5 - 1\frac{9}{10} = 4\frac{10}{10} - 1\frac{9}{10}$
$= \mathbf{3\frac{1}{10}}$

Exercise 2

1. $5 \div 7 = \mathbf{\frac{5}{7}}$
2. $2\frac{7}{8} = \mathbf{2.88}$
3. $1\frac{3}{8} + 3\frac{1}{12} = 1\frac{36}{96} + 3\frac{8}{96}$
$= 4\frac{44}{96}$
$= \mathbf{4\frac{11}{24}}$
4. $1\frac{9}{10} + 2\frac{1}{5} = 1\frac{9}{10} + 2\frac{2}{10}$
$= 3\frac{11}{10}$
$= \mathbf{4\frac{1}{10}}$
5. $6\frac{1}{2} - 2\frac{5}{6} = 6\frac{3}{6} - 2\frac{5}{6}$
$= 5\frac{9}{6} - 2\frac{5}{6}$
$= 3\frac{4}{6}$
$= \mathbf{3\frac{2}{3}}$
6. $3\frac{1}{4} - 1\frac{1}{10} = 3\frac{10}{40} - 1\frac{4}{40}$
$= 2\frac{6}{40}$
$= \mathbf{2\frac{3}{20}}$
7. $10 \div 6 = \frac{10}{6}$
$= \frac{5}{3}$
$= \mathbf{1\frac{2}{3}}$
8. $1\frac{1}{4} + 1\frac{2}{3} = 1\frac{3}{12} + 1\frac{8}{12}$
$= \mathbf{2\frac{11}{12}}$
9. $2\,l - 1\frac{1}{5}\,l = \frac{4}{5}\,l$
10. $\frac{3}{4} + 2\frac{4}{5} = \frac{15}{20} + 2\frac{16}{20}$
$= 2\frac{31}{20}$
$= \mathbf{3\frac{11}{20}}$

Level 2

Exercise 1

1. $2\frac{7}{10} + 1\frac{1}{4} = 2\frac{28}{40} + 1\frac{10}{40}$
$= 3\frac{38}{40}$
$= \mathbf{3\frac{19}{20}}$
2. $1\frac{7}{12} - 1\frac{1}{2} = 1\frac{7}{12} - 1\frac{6}{12}$
$= \mathbf{\frac{1}{12}}$
3. $3\frac{1}{6} + 3\frac{8}{9} = 3\frac{9}{54} + 3\frac{48}{54}$
$= 6\frac{57}{54}$
$= 7\frac{3}{54}$
$= \mathbf{7\frac{1}{18}}$
4. $3\frac{2}{3} - 1\frac{1}{5} = 3\frac{10}{15} - 1\frac{3}{15}$
$= \mathbf{2\frac{7}{15}}$
5. $4\frac{3}{4} - 1\frac{1}{2} = 4\frac{3}{4} - 1\frac{2}{4}$
$= \mathbf{3\frac{1}{4}}$
6. $3\frac{7}{8} - 1\frac{1}{12} = 3\frac{84}{96} - 1\frac{8}{96}$
$= 2\frac{76}{96}$
$= \mathbf{2\frac{19}{24}}$
7. $5\frac{7}{10} - 4\frac{1}{2} = 5\frac{7}{10} - 4\frac{5}{10}$
$= 1\frac{2}{10}$
$= \mathbf{1\frac{1}{5}}$
8. $1\frac{5}{6} + 1\frac{5}{6} = 2\frac{10}{6}$
$= 3\frac{4}{6}$
$= \mathbf{3\frac{2}{3}}$
9. $1\frac{1}{5} + 3\frac{1}{4} = 1\frac{4}{20} + 3\frac{5}{20}$
$= \mathbf{4\frac{9}{20}}$
10. $3\frac{1}{4} - 1\frac{1}{5} = 3\frac{5}{20} - 1\frac{4}{20}$
$= \mathbf{2\frac{1}{20}}$

Exercise 2

1. (3)

$6\frac{8}{25} = 6 + 0.32$

$= 6.32$

2. (4)

$3\frac{5}{9} + 4\frac{8}{9} = 7\frac{13}{9}$

$= 8\frac{4}{9}$

3. (2)

$4\frac{2}{7} - 1\frac{5}{7} = 3\frac{9}{7} - 1\frac{5}{7}$

$= 2\frac{4}{7}$

4. (1)

$3\frac{3}{8} - 2\frac{1}{3} = 3\frac{9}{24} - 2\frac{8}{24}$

$= 1\frac{1}{24}$

5. (4)

$3\frac{5}{9} + 1\frac{3}{4} = 3\frac{20}{36} + 1\frac{27}{36}$

$= 4\frac{47}{36}$

$= 5\frac{11}{36}$

6. (2)

$6 - 2\frac{1}{6} = 5\frac{6}{6} - 2\frac{1}{6}$

$= 3\frac{5}{6}$

7. (4)

$12 \div 5 = \frac{12}{5}$

$= 2\frac{2}{5}$

8. (3)

$20 - 3 - 7 = 10$

$10 \div 3 = \frac{10}{3}$

$= 3\frac{1}{3}$

9. (3)

$\frac{2}{5} + \frac{1}{6} = \frac{12}{30} + \frac{5}{30}$

$= \frac{17}{30}$

10. (4)

$2\frac{1}{5} - \frac{1}{4} = 2\frac{4}{20} - \frac{5}{20}$

$= 1\frac{24}{20} - \frac{5}{20}$

$= 1\frac{19}{20}$

Level 3

Exercise 1

1. $4\frac{3}{8} - 1\frac{3}{4} = 4\frac{3}{8} - 1\frac{6}{8}$

$= 3\frac{11}{8} - 1\frac{6}{8}$

$= 2\frac{5}{8}$

$2\frac{5}{8} - 1\frac{3}{4} = 2\frac{5}{8} - 1\frac{6}{8}$

$= 1\frac{13}{8} - 1\frac{6}{8}$

$= \frac{7}{8}$

2. $2\frac{2}{5} - 1\frac{9}{10} = 2\frac{4}{10} - 1\frac{9}{10}$

$= 1\frac{14}{10} - 1\frac{9}{10}$

$= \frac{5}{10}$

$= \frac{1}{2}$

3. $10 - 2\frac{3}{10} = 9\frac{10}{10} - 2\frac{3}{10}$

$= 7\frac{7}{10}$

4. $1\frac{4}{5} - \frac{3}{4} - \frac{2}{5} = 1\frac{16}{20} - \frac{15}{20} - \frac{8}{20}$

$= \frac{36}{20} - \frac{15}{20} - \frac{8}{20}$

$= \frac{13}{20}$

5. $1 - \frac{1}{6} - \frac{1}{4} = \frac{24}{24} - \frac{4}{24} - \frac{6}{24}$

$= \frac{14}{24}$

$= \frac{7}{12}$

6. $2\frac{5}{12} - 1\frac{3}{4} = 2\frac{5}{12} - 1\frac{9}{12}$

$= 1\frac{17}{12} - 1\frac{9}{12}$

$= \frac{8}{12}$

$= \frac{2}{3}$

7. $7\frac{1}{4} + 1\frac{9}{10} = 7\frac{10}{40} + 1\frac{36}{40}$

$= 8\frac{46}{40}$

$= 9\frac{6}{40}$

$= 9\frac{3}{20}$

8. $3\frac{1}{2} + 3\frac{1}{2} = 7$

9. $1\frac{2}{3} + 1\frac{2}{3} + 1\frac{2}{3} = 3\frac{6}{3}$

$= 5$

10. $10\frac{1}{2} - 5\frac{3}{5} = 10\frac{5}{10} - 5\frac{6}{10}$
$= 9\frac{15}{10} - 5\frac{6}{10}$
$= 4\frac{9}{10}$
$5\frac{3}{5} - 4\frac{9}{10} = 5\frac{6}{10} - 4\frac{9}{10}$
$= 4\frac{16}{10} - 4\frac{9}{10}$
$= \frac{7}{10}$

Exercise 2

1. $6 - 1\frac{1}{6} - 2\frac{7}{12} = 5\frac{6}{6} - 1\frac{1}{6} - 2\frac{7}{12}$
$= 4\frac{5}{6} - 2\frac{7}{12}$
$= 4\frac{10}{12} - 2\frac{7}{12}$
$= 2\frac{3}{12}$
$= 2\frac{1}{4}$

2. $6\frac{1}{10} + 1\frac{3}{10} + 2\frac{1}{2} = 6\frac{1}{10} + 1\frac{3}{10} + 2\frac{5}{10}$
$= 9\frac{9}{10}$

3. Mass of second mango
$\rightarrow \frac{5}{8} + \frac{1}{4}$
$= \frac{5}{8} + \frac{2}{8}$
$= \frac{7}{8}$ kg

Mass of third mango
$\rightarrow \frac{7}{8} - \frac{1}{8}$
$= \frac{6}{8}$ kg

Total mass
$\rightarrow \frac{5}{8} + \frac{7}{8} + \frac{6}{8}$
$= \frac{18}{8}$
$= 2\frac{2}{8}$
$= 2\frac{1}{4}$ kg

4. (a) Jacky: $1\frac{1}{4}$ h $= 1\frac{5}{20}$ h
Prakash: $1\frac{2}{5}$ h $= 1\frac{8}{20}$ h
Halim: $1\frac{1}{10}$ h $= 1\frac{2}{20}$ h
Prakash took the longest time to reach school.

(b) $1\frac{8}{20} - 1\frac{2}{20} = \frac{6}{20}$
$= \frac{3}{10}$
The difference in time is $\frac{3}{10}$ h.

5. $3\frac{1}{12} - \frac{1}{4} = 3\frac{1}{12} - \frac{3}{12}$
$= 2\frac{13}{12} - \frac{3}{12}$
$= 2\frac{10}{12}$
$= 2\frac{5}{6}$
$3\frac{1}{12} + 2\frac{5}{6} = 3\frac{1}{12} + 2\frac{10}{12}$
$= 5\frac{11}{12}$

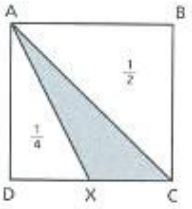
6. $1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4} = 4\frac{4}{4}$
$= 5$

7. $6\frac{1}{5}$ cm + $6\frac{1}{5}$ cm + $6\frac{1}{5}$ cm + $6\frac{1}{5}$ cm = $24\frac{4}{5}$ cm

8. $(\frac{3}{4} + \frac{7}{12} + \frac{3}{4} + \frac{7}{12})$ m
$= (\frac{9}{12} + \frac{7}{12} + \frac{9}{12} + \frac{7}{12})$ m
$= \frac{32}{12}$ m
$= 2\frac{2}{3}$ m

9. $(5\frac{1}{4} + 2\frac{3}{10} + 5\frac{1}{4} + 2\frac{3}{10})$ cm
$= (5\frac{10}{40} + 2\frac{12}{40} + 5\frac{10}{40} + 2\frac{12}{40})$ cm
$= 14\frac{44}{40}$ cm
$= 15\frac{4}{40}$ cm
$= 15\frac{1}{10}$ cm

10. $1 - \frac{1}{2} - \frac{1}{4} = \frac{1}{4}$



Chapter 3 Fractions 2

Level 1

Exercise 1

1. (a) $\frac{1}{2} \times \frac{2}{3} = \frac{2}{6}$
$= \frac{1}{3}$
(b) $\frac{1}{5} \times \frac{3}{4} = \frac{3}{20}$
(c) $\frac{4}{9} \times \frac{1}{2} = \frac{4}{18}$
$= \frac{2}{9}$
(d) $\frac{3}{10} \times \frac{5}{6} = \frac{15}{60}$
$= \frac{1}{4}$

2. (a) $\frac{20}{3} \times \frac{2}{11} = \frac{40}{33}$
$= 1\frac{7}{33}$

(b) $\frac{3}{9} \times \frac{13}{3} = \frac{26}{27}$

(c) $\frac{3}{10} \times \frac{5}{1} = \frac{15}{2}$
$= 7\frac{1}{2}$

(d) $\frac{10}{7} \times \frac{10}{1} = \frac{100}{7}$
$= 14\frac{2}{7}$

3. (a) $1\frac{2}{3} \times 4 = \frac{5}{3} \times \frac{4}{1}$
$= \frac{20}{3}$
$= 6\frac{2}{3}$

(b) $3\frac{5}{6} \times 18 = \frac{23}{6} \times \frac{3}{1}$
$= 69$

(c) $10 \times 4\frac{4}{5} = \frac{2}{1} \times \frac{24}{5}$
$= 48$

(d) $3\frac{2}{9} \times 21 = \frac{29}{3} \times \frac{7}{1}$
$= \frac{203}{3}$
$= 67\frac{2}{3}$

4. (a) $\frac{5}{6} \div 3 = \frac{5}{6} \times \frac{1}{3}$
$= \frac{5}{18}$

(b) $\frac{4}{5} \div 8 = \frac{1}{5} \times \frac{1}{2}$
$= \frac{1}{10}$

(c) $\frac{7}{9} \div 14 = \frac{1}{9} \times \frac{1}{2}$
$= \frac{1}{18}$

(d) $\frac{3}{10} \div 9 = \frac{1}{10} \times \frac{1}{3}$
$= \frac{1}{30}$

5. $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

6. $\frac{7}{5} \times \frac{1}{5} = \frac{7}{25}$

7. $\frac{3}{4} \div 6 = \frac{1}{4} \times \frac{1}{2}$
$= \frac{1}{8}$

8. $5 \times 2\frac{3}{5} = \frac{1}{1} \times \frac{13}{1}$
$= 13$

9. $1 - \frac{3}{4} = \frac{1}{4}$
$\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$

10. $\frac{8}{9} \div 2 = \frac{4}{9} \times \frac{1}{1}$
$= \frac{4}{9}$

Exercise 2

1. $\frac{2}{5} \div 4 = \frac{1}{5} \times \frac{1}{2}$
$= \frac{1}{10}$

2. $\frac{7}{8} \div 5 = \frac{7}{8} \times \frac{1}{5}$
$= \frac{7}{40}$

3. $\frac{4}{5} \div 6 = \frac{2}{5} \times \frac{1}{3}$
$= \frac{2}{15}$

4. $2\frac{3}{4} \times 4 = \frac{11}{1} \times \frac{1}{1}$
$= 11$

5. (a) $1 - \frac{5}{8} = \frac{3}{8}$

(b) $\frac{3}{8} \times 40 = 15$

6. Amount of money left → 9 units – 2 units
→ 7 units
→ \$14

1 unit → \$14 ÷ 7
= \$2

Amount of money at first → 9 units
→ 9 × \$2
= \$18

7. (a) $1 - \frac{1}{1} = \frac{1}{2}$

(b) $\frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$

8. $1 - \frac{3}{8} = \frac{5}{8}$
$\frac{5}{8} \times \frac{2}{5} = \frac{1}{4}$

9. $1 - \frac{1}{3} = \frac{1}{2}$
$\frac{4}{9} \times \frac{3}{8} = \frac{1}{6}$

10. (a) $1 - \frac{2}{5} = \frac{3}{5}$

(b) $\frac{3}{5} \div 6 = \frac{3}{5} \times \frac{1}{6}$
$= \frac{3}{30}$
$= \frac{1}{10}$

Level 2

Exercise 1

1. (a) $1 - \frac{1}{10} = \frac{9}{10}$
$\frac{9}{10} \times \frac{7}{9} = \frac{7}{10}$

(b) $\frac{7}{10} \times \$1000 = \$700$

2. (a) $\frac{7}{8} \times 160 = 140$

(b) $160 - 140 = 20$
$\frac{3}{4} \times 20 = 15$

(c) $20 - 15 = 5$

3. (a) $\frac{1}{2} \times 1500\ m\ell = 750\ m\ell$

$\frac{7}{10} \times 750\ m\ell = \mathbf{525\ m\ell}$

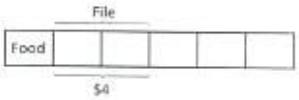
(b) $750\ m\ell - 525\ m\ell = \mathbf{225\ m\ell}$

4. (a) $\frac{3}{7} \times 280 = \mathbf{120}$

(b) $280 - 120 = 160$

$\frac{1}{2} \times 160 = \mathbf{80}$

5. (a)

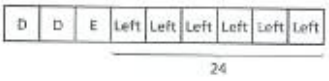


Amount of money spent on file
→ 2 units
= $4
Amount of money spent on food
→ 1 unit
→ $4 ÷ 2
= **$2**

(b) Amount of money left
→ 3 units
→ 3 × $2
= **$6**

(c) Total amount of money
→ 6 units
→ 6 × $2
= **$12**

6. (a)

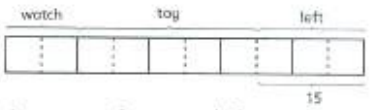


Number of sweets left
→ 6 units
= 24
1 unit → 24 ÷ 6
= 4
David → 2 units
→ 2 × 4
= **8**

(b) Evelyn → 1 unit
= **4**

(c) Total number of sweets
→ 9 units
→ 9 × 4
= **36**

7. (a)

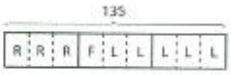


Amount of money left → 3 units
= $15
1 unit → $15 ÷ 3
= $5
Amount of money spent on watch
→ 2 units
→ 2 × $5
= **$10**

(b) Total amount of money
→ 10 units
→ 10 × $5
= **$50**

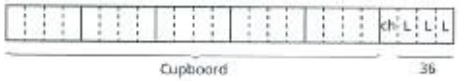
(c) Difference in cost between toy and watch
→ 5 units – 2 units
→ 3 units
→ 3 × $5
= **$15**

8.



Total number of tickets
→ 9 units
= $135
1 unit → 135 ÷ 9
= 15
Difference between number of tickets sold to relatives and friends
→ 3 units – 1 unit
→ 2 units
→ 2 × 15
= **30**

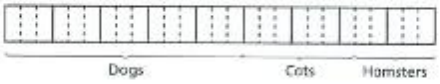
9. (a)



Number of nails left
→ 3 units
= 36
1 unit → 36 ÷ 3
= 12
Number of nails used to make cupboard
→ 20 units
Number of nails used to make chair
→ 1 unit
Difference → 20 units – 1 unit
→ 19 units
→ 19 × 12
= **228**

(b) Total number of nails
→ 24 units
→ 24 × 12
= **288**

10. (a)



Number of dogs → 15 units
Number of cats → 7 units
Difference → 15 units – 7 units
→ 8 units
= 16
1 unit → 16 ÷ 8
= 2
Number of hamsters → 5 units
→ 5 × 2
= **10**

(b) Total number of animals
→ 27 units
→ 27 × 2
= **54**

Exercise 2

1. **(3)**

$\frac{12^{3}}{7} \times \frac{3}{\cancel{4}_{1}} = \frac{9}{7}$

$= 1\frac{2}{7}$

2. **(4)**

$\frac{9}{10} \div 6 = \frac{\cancel{9}^{3}}{10} \times \frac{1}{\cancel{6}_{2}}$

$= \frac{3}{20}$

3. **(4)**

$\frac{9}{10} - \frac{2}{5} - \frac{2}{5} = \frac{9}{10} - \frac{4}{10} - \frac{4}{10}$

$= \frac{1}{10}$

$\frac{1}{10} \div 2 = \frac{1}{10} \times \frac{1}{2}$

$= \frac{1}{20}$

4. **(1)**

$1 - \frac{4}{9} = \frac{5}{9}$

$1 - \frac{2}{5} = \frac{3}{5}$

$\frac{\cancel{5}^{1}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{5}_{1}} = \frac{1}{3}$

5. **(2)**

$1 - \frac{1}{4} = \frac{3}{4}$

$1 - \frac{5}{6} = \frac{1}{6}$

$\frac{\cancel{3}^{1}}{4} \times \frac{1}{\cancel{6}_{2}} = \frac{1}{8}$

6. **(2)**

$1 - \frac{1}{10} = \frac{9}{10}$

$1 - \frac{1}{3} = \frac{2}{3}$

$\frac{\cancel{9}^{3}}{\cancel{10}_{5}} \times \frac{\cancel{2}^{1}}{\cancel{3}_{1}} = \frac{3}{5}$

7. **(1)**

$70 \times \frac{3}{10} = 21$

$70 - 21 = 49$

$1 - \frac{1}{7} = \frac{6}{7}$

$\frac{6}{7} \times 49 = 42$

8. **(3)**

$\frac{2}{9}$ of remainder → 6

$\frac{9}{9}$ of remainder → 6 ÷ 2 × 9

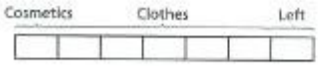
= 27

$\frac{3}{4}$ of whole → 27

$\frac{4}{4}$ of whole → 27 ÷ 3 × 4

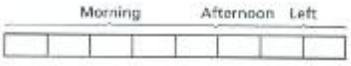
= 36

9. **(3)**



5 units – 1 units = 4 units
4 units → $420
1 unit → $420 ÷ 4
= $105

10. **(2)**



2 units → 48
5 units – 1 unit = 4 units
4 units → 48 × 2
= 96

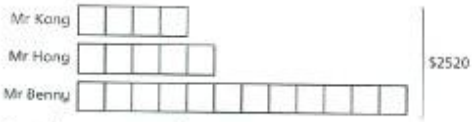
Level 3

Exercise 1

*1.

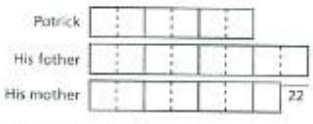
Total number of marbles
→ 17 units
= 204
1 unit → 204 ÷ 17
= 12
Tom → 2 units
→ 2 × 12
= **24**
Zack → 3 units
→ 3 × 12
= **36**
Willy → 12 units
→ 12 × 12
= **144**

*2.



Total amount of money
→ 21 units
→ $2520
1 unit → $2520 ÷ 21
= $120
Mr Kang → 4 units
→ 4 × $120
= **$480**
Mr Hong → 5 units
→ 5 × $120
= **$600**
Mr Benny → 12 units
→ 12 × $120
= **$1440**

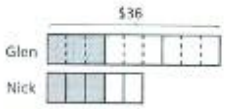
3.



Patrick's father → 8 units
Patrick's mother → 7 units
Difference in height between his father and his mother
→ 8 units – 7 units
= 1 unit
= 22 cm

Patrick → 6 units
→ 6 × 22
= **132 cm**

4.



Glen → 9 units
= $36
1 unit → $36 ÷ 9
= $4
Nick → 5 units
→ 5 × $4
= **$20**

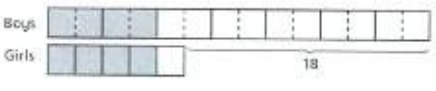
5.

X → 10 units
Y → 9 units
Difference between X and Y
→ 10 units – 9 units
→ 1 unit
= 100
Sum of X and Y
→ 19 units
→ 19 × 100
= **1900**

6.

Total amount of money
→ 20 units
= $900
1 unit → $900 ÷ 20
= $45
Amount of money Mr Boey spent
→ 2 units
→ 2 × $45
= **$90**
Amount of money Mrs Boey spent
→ 12 units
→ 12 × $45
= **$540**

7.



Difference in number between boys and girls
→ 14 units – 5 units
→ 9 units
= 18

1 unit → 18 ÷ 9
= 2
Number of boys
→ 14 units
→ 14 × 2
= **28**

8.

2 units → $48
1 unit → $48 ÷ 2
= $24
Kumar → 3 units
→ 3 × $24
= **$72**
Benjamin → 8 units
→ 8 × $24
= **$192**

9.

3 units → 12
1 unit → 12 ÷ 3
= 4
Total number of pupils at first
→ 7 units
→ 7 × 4
= **28**

10.

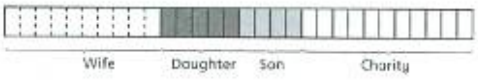
1 unit → 3
Number of pupils in the class in the end
→ 8 units
→ 8 × 3
= **24**

Exercise 2

1. Fraction of novel read by end of Saturday → $\frac{3}{10}$
Fraction of novel read by end of Sunday
→ $\frac{3}{10} + \frac{1}{10} = \frac{4}{10}$
Fraction of novel read by end of Monday
→ $\frac{4}{10} + \frac{1}{5} = \frac{6}{10}$
Fraction of novel read by end of Tuesday
→ $\frac{6}{10} + \frac{1}{5} = \frac{8}{10}$
Fraction of novel read by end of Wednesday
→ $\frac{8}{10} + \frac{1}{5} = 1$
She will complete reading the novel on **Wednesday**.

2. Fraction of money used by end of 1st day = $\frac{1}{12}$
Fraction of money used by end of 2nd day
= $\frac{1}{12} + \frac{1}{6} = \frac{1}{4}$
Fraction of money used by end of 3rd day
= $\frac{1}{4} + \frac{1}{8} = \frac{3}{8}$
Fraction of money used by end of 4th day
= $\frac{3}{8} + \frac{1}{8} = \frac{1}{2}$
Fraction of money used by end of 5th day
= $\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$
Fraction of money used by end of 6th day
= $\frac{5}{8} + \frac{1}{8} = \frac{3}{4}$
Fraction of money used by end of 7th day
= $\frac{3}{4} + \frac{1}{8} = \frac{7}{8}$
Fraction of money used by end of 8th day
= $\frac{7}{8} + \frac{1}{8} = 1$
He will use up all his money on the **8th day**.

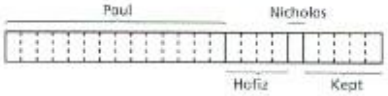
3.



(a) Daughter → $\frac{1}{4} \times \frac{2}{3} = \frac{1}{6}$

(b) Daughter → $\frac{1}{6} = \frac{5}{30}$ → 5 units
Son → $\frac{1}{5} \times \frac{2}{3} = \frac{2}{15}$
= $\frac{4}{30}$ → 4 units
Wife → $\frac{1}{3} = \frac{10}{30}$ → 10 units
= $200 000
1 unit → $200 000 ÷ 10
= $20 000
Charity → 30 – 10 – 4 – 5
= 11 units
= 11 × $20 000
= **$220 000**

4.



(a) Nicholas → $\frac{1}{10} \times \frac{5}{12} = \frac{1}{24}$

(b) Nicholas → $\frac{1}{24}$ → 1 unit

Hafiz → $\frac{2}{5} \times \frac{5}{12}$

$= \frac{1}{6} = \frac{4}{24}$ → 4 units

4 units → 12

1 unit → 12 ÷ 4

= 3

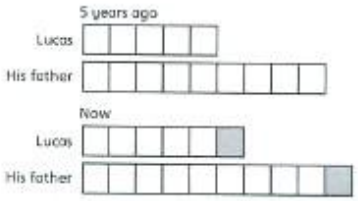
Total number of marbles

→ 24 units

= 24 × 3

= 72

5.



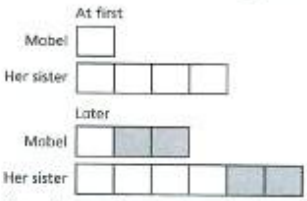
1 unit → 5 years

Lucas' age now → 6 units

→ 6 × 5

= **30 years**

6.



2 units → 4 years

1 unit → 4 ÷ 2

= 2 years

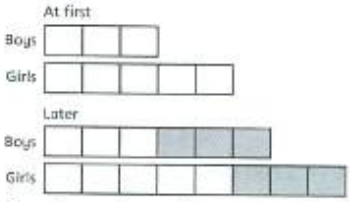
Sister's age 4 years from now

→ 6 units

→ 6 × 2

= **12 years**

7.



3 units → 6 pupils

1 unit → 6 ÷ 3

= 2

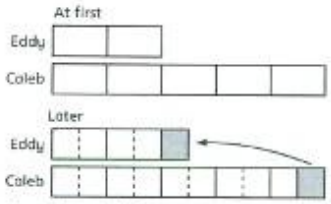
Total number of pupils at first

→ 8 units

→ 8 × 2

= **16**

8.



1 unit → $10

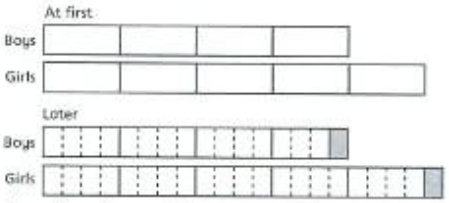
Amount of money Eddy had at first

→ 4 units

→ 4 × $10

= **$40**

9.



1 unit → 1 pupil

Number of girls on the bus now

→ 21 units

→ 21 × 1

= **21**

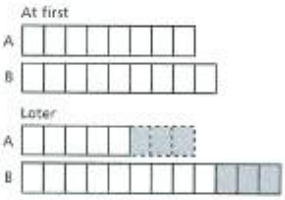
Number of boys on the bus now

→ 15 units

→ 15 × 1

= **15**

10.



3 units → 300 m*l*

1 unit → 300 m*l* ÷ 3

= 100 m*l*

Total amount of water in both containers

→ 17 units

→ 17 × 100 m*l*

= **1700 m*l***

Chapter 4 Area of Triangle

Level 1

Exercise 1

1. BC
2. KM
3. EF
4. (a) XZ (b) YZ
5. RT
6. (a) IJ (b) HI
7. ST

8. (a) PS (b) RT

9. Area of triangle A = $\frac{1}{2}$ × 3 × 4 = 6 cm²

   Area of triangle B = $\frac{1}{2}$ × 2 × 5 = 5 cm²

   Area of triangle C = $\frac{1}{2}$ × 3 × 2 = 3 cm²

10. 6 cm² – 3 cm² = **3 cm²**

Exercise 2

1. (a) $\frac{1}{2}$ × 3 × 4 = **6**

   (b) 4 + 13 = 17

   $\frac{1}{2}$ × 8 × 17 = **68**

   (c) 2 + 6 = 8

   $\frac{1}{2}$ × 8 × 8 = **32**

2. (a) $\frac{1}{2}$ × 18 × 12 = **108**

   (b) $\frac{1}{2}$ × 10 × 9 = **45**

   (c) $\frac{1}{2}$ × 10 × 5 = **25**

3. YZ = 23 cm + 7 cm
   = 30 cm
   Area of triangle XYZ
   → $\frac{1}{2}$ × 30 cm × 9 cm
   = **135 cm²**

4. $\frac{1}{2}$ × 12 m × 8 m = **48 m²**

5. KL = 10 cm + 34 cm
   = 44 cm
   Area of triangle JKL
   → $\frac{1}{2}$ × 44 cm × 21 cm
   = **462 cm²**

6. DC = 8 cm + 8 cm
   = 16 cm
   Area of shaded triangle
   → $\frac{1}{2}$ × 16 cm × 8 cm
   = **64 cm²**

7. 16 cm – 6 cm = 10 cm
   Area of shaded triangle
   → $\frac{1}{2}$ × 10 cm × 7 cm
   = **35 cm²**

8. VT = 12 cm ÷ 2
   = 6 cm
   Area of shaded triangle
   → $\frac{1}{2}$ × 6 cm × 9 cm
   = **27 cm²**

9. $\frac{1}{2}$ × 20 cm × 20 cm = **200 cm²**

10. $\frac{1}{2}$ × 8 cm × 8 cm = **32 cm²**

Level 2

Exercise 1

1. $\frac{1}{2}$ × 25 cm × 16 cm × 2 = **400 cm²**

2. 6 × 14.5 cm² = **87 cm²**

3. Area of triangle
   → $\frac{1}{2}$ × 9 cm × 4 cm
   = 18 cm²
   Area of rectangle
   → 9 cm × 7 cm
   = 63 cm²
   Area of the shaded part
   → 63 cm² – 18 cm²
   = **45 cm²**

4. Area of triangle
   → $\frac{1}{2}$ × 8 cm × 14 cm
   = 56 cm²
   Area of rectangle
   → 30 cm × 22 cm
   = 660 cm²
   Area of shaded portion
   → 660 cm² – 56 cm²
   = **604 cm²**

5. Area of triangle
   → $\frac{1}{2}$ × 12 cm × 14 cm
   = 84 cm²
   Area of rectangle
   → 12 cm × 27 cm
   = 324 cm²
   Area of shaded portion
   → 324 cm² – 84 cm²
   = **240 cm²**

6. Area of smaller shaded triangle
   → $\frac{1}{2}$ × 12 cm × 17 cm
   = 102 cm²
   Area of larger shaded triangle
   → $\frac{1}{2}$ × (30 cm – 12 cm) × 17 cm
   → $\frac{1}{2}$ × 18 cm × 17 cm
   = 153 cm²
   Area of shaded portion
   → 102 cm² + 153 cm²
   = **255 cm²**

7. $\frac{1}{2} \times 2\text{ cm} \times 2\text{ cm} \times 4 = \mathbf{8\ cm^2}$
8. $(\frac{1}{2} \times 2\text{ cm} \times 2\text{ cm} \times 2) + (1\text{ cm} \times 2\text{ cm})$
   $= \mathbf{6\ cm^2}$
9. Base of shaded figure
   $\rightarrow 5 \times 2\text{ cm}$
   $= 10\text{ cm}$
   Height of shaded figure
   $\rightarrow 3 \times 2\text{ cm}$
   $= 6\text{ cm}$
   Area of shaded figure
   $\rightarrow \frac{1}{2} \times 10\text{ cm} \times 6\text{ cm}$
   $= \mathbf{30\ cm^2}$
10. Base of shaded figure
    $\rightarrow 4 \times 3\text{ cm}$
    $= 12\text{ cm}$
    Height of shaded figure
    $\rightarrow 3 \times 3\text{ cm}$
    $= 9\text{ cm}$
    Area of shaded figure
    $\rightarrow \frac{1}{2} \times 12\text{ cm} \times 9\text{ cm}$
    $= \mathbf{54\ cm^2}$

Exercise 2

1. **(2)**
   PQ is the base.
2. **(2)**
   $\frac{1}{2} \times 10 \times 24 = 120$
3. **(3)**
   $\frac{1}{2} \times 6 \times 16 = 48$
4. **(4)**
   $(\frac{1}{2} \times 1\text{ cm} \times 3\text{ cm} \times 2) + (3\text{ cm} \times 3\text{ cm})$
   $= 3\text{ cm}^2 + 9\text{ cm}^2$
   $= 12\text{ cm}^2$
5. **(4)**
   $(6\text{ cm} \times 6\text{ cm}) + (\frac{1}{2} \times 6\text{ cm} \times 4\text{ cm})$
   $= 36\text{ cm}^2 + 12\text{ cm}^2$
   $= 48\text{ cm}^2$
6. **(3)**
   Base of shaded triangle → JM = 9 cm
   Height of shaded triangle → JK = 12 cm
7. **(1)**
   BE is the height.
8. **(4)**
   UV is the base.

*9. **(4)**
   Area of triangle Y → $\frac{1}{2} \times 20\text{ cm} \times 48\text{ cm}$
   $= 480\text{ cm}^2$
   Breadth of rectangle X → $480\text{ cm}^2 \div 32\text{ cm}$
   $= 15\text{ cm}$
   Perimeter of rectangle X → $(32\text{ cm} + 15\text{ cm}) \times 2$
   $= 94\text{ cm}$
10. **(2)**
    Area of square paper → 15×15
    $= 225\text{ cm}^2$
    Area of triangle → $\frac{1}{2} \times 5\text{ cm} \times 4\text{ cm}$
    $= 10\text{ cm}^2$
    Area of remaining paper → $225\text{ cm}^2 - 10\text{ cm}^2$
    $= 215\text{ cm}^2$

Level 3

Exercise 1

1. Area of triangle
   $\rightarrow \frac{1}{2} \times 6\text{ cm} \times (9\text{ cm} - 6\text{ cm})$
   $= \frac{1}{2} \times 6\text{ cm} \times 3\text{ cm}$
   $= 9\text{ cm}^2$
   Area of square
   $\rightarrow 6\text{ cm} \times 6\text{ cm}$
   $= 36\text{ cm}^2$
   Area of figure
   $\rightarrow 9\text{ cm}^2 + 36\text{ cm}^2$
   $= \mathbf{45\ cm^2}$
2. Total area of the two triangle
   $\rightarrow \frac{1}{2} \times 14\text{ cm} \times 8\text{ cm} + \frac{1}{2} \times 14\text{ cm} \times 7\text{ cm}$
   $= 105\text{ cm}^2$
   Area of rectangle
   $\rightarrow 20\text{ cm} \times 14\text{ cm}$
   $= 280\text{ cm}^2$
   Area of shaded part
   $\rightarrow 280\text{ cm}^2 - 105\text{ cm}^2$
   $= \mathbf{175\ cm^2}$
3. Area of shaded part
   → Difference in areas between the two triangles
   $= \frac{1}{2} \times 15\text{ cm} \times 12\text{ cm} - \frac{1}{2} \times 15\text{ cm} \times 4\text{ cm}$
   $= \mathbf{60\ cm^2}$
4. Area of shaded part
   → Difference in areas between the two triangles
   $= \frac{1}{2} \times 24\text{ cm} \times 13\text{ cm} - \frac{1}{2} \times 20\text{ cm} \times 10\text{ cm}$
   $= \mathbf{56\ cm^2}$

*5. Area of shaded part
→ Difference in areas between the two triangles
$= \frac{1}{2} \times 20\text{ cm} \times 10\text{ cm} - \frac{1}{2} \times 8\text{ cm} \times 8\text{ cm}$
$= \mathbf{68\text{ cm}^2}$

*6. Area of whole figure
$\rightarrow \frac{1}{2} \times 20\text{ cm} \times 10\text{ cm}$
$= 100\text{ cm}^2$
Fraction of the shaded part
$\rightarrow \frac{68}{100}$
$= \frac{17}{25}$

*7. Sum of areas of the three triangles
$\rightarrow \frac{1}{2} \times 8\text{ cm} \times 9\text{ cm} + \frac{1}{2} \times 16\text{ cm} \times 5\text{ cm} + \frac{1}{2} \times 6\text{ cm} \times 12\text{ cm}$
$= 36\text{ cm}^2 + 40\text{ cm}^2 + 36\text{ cm}^2$
$= 112\text{ cm}^2$
Area of rectangle
$\rightarrow 14\text{ cm} \times (8\text{ cm} + 16\text{ cm} + 6\text{ cm})$
$= 14\text{ cm} \times 30\text{ cm}$
$= 420\text{ cm}^2$
Area of shaded part
$\rightarrow 420\text{ cm}^2 - 112\text{ cm}^2$
$= \mathbf{308\text{ cm}^2}$

*8. Fraction of the shaded part $= \frac{308}{420} = \frac{11}{15}$

*9. Length of base of shaded triangle
$\rightarrow 96\text{ cm} - 39\text{ cm} - 36\text{ cm} - 9\text{ cm}$
$= 12\text{ cm}$
Area of shaded triangle
$\rightarrow \frac{1}{2} \times 12\text{ cm} \times 9\text{ cm}$
$= \mathbf{54\text{ cm}^2}$

*10. Perimeter of Square A
$\rightarrow 18\text{ cm} \times 4$
$= 72\text{ cm}$
Length of missing side of Triangle B
$\rightarrow 72\text{ cm} - 18\text{ cm} - 30\text{ cm}$
$= 24\text{ cm}$
Difference in areas between Square A and Triangle B
$= 18\text{ cm} \times 18\text{ cm} - \frac{1}{2} \times 18\text{ cm} \times 24\text{ cm}$
$= 324\text{ cm}^2 - 216\text{ cm}^2$
$= \mathbf{108\text{ cm}^2}$

Exercise 2

1. (a) XW → 2 units
$= 20\text{ cm}$
1 unit → $20\text{ cm} \div 2$
$= 10\text{ cm}$
XY → 3 units
$\rightarrow 3 \times 10\text{ cm}$
$= \mathbf{30\text{ cm}}$

(b) Area of triangle XYZ
$\rightarrow \frac{1}{2} \times 30\text{ cm} \times 13\text{ cm}$
$= \mathbf{195\text{ cm}^2}$

*2. QT → 3 units
$= 15\text{ cm}$
1 unit → $15\text{ cm} \div 3$
$= 5\text{ cm}$
PT → 2 units
$\rightarrow 2 \times 5\text{ cm}$
$= \mathbf{10\text{ cm}}$
PQ → 5 units
$\rightarrow 5 \times 5\text{ cm}$
$= \mathbf{25\text{ cm}}$

*3. Area of triangle
$\rightarrow \frac{1}{2} \times 10\text{ cm} \times 6\text{ cm}$
$= 30\text{ cm}^2$
Area of rectangle
$\rightarrow 13\text{ cm} \times 25\text{ cm}$
$= 325\text{ cm}^2$
Area of shaded part
$\rightarrow 325\text{ cm}^2 - 30\text{ cm}^2$
$= \mathbf{295\text{ cm}^2}$

*4. Fraction of the shaded part $= \frac{295}{325} = \frac{59}{65}$

*5. HG → 6 units
$= 42\text{ cm}$
JG → 1 unit
$= 42\text{ cm} \div 6$
$= 7\text{ cm}$
GF → 3 units
$= 18\text{ cm}$
GK → 1 unit
$= 18\text{ cm} \div 3$
$= 6\text{ cm}$
Area of triangle GJK → $\frac{1}{2} \times 7\text{ cm} \times 6\text{ cm}$
$= 21\text{ cm}^2$
Area of four identical triangles
$\rightarrow 21\text{ cm}^2 \times 4$
$= 84\text{ cm}^2$

Area of cardboard
→ 42 cm × 18 cm
= 756 cm²
Area of remaining cardboard
→ 756 cm² – 84 cm²
= **672 cm²**

*6. (a) Fraction of the cardboard cut away
$= \frac{84}{756} = \frac{1}{9}$

(b) Fraction of the cardboard left = $1 - \frac{1}{9}$
$= \frac{8}{9}$

7. Area of each triangle
→ $\frac{1}{2}$ × 36 cm × 15 cm
= 270 cm²
Total area of shaded parts
→ 270 cm² × 4
= **1080 cm²**

8. GH = 36 cm – 15 cm
= **21 cm**

9. Perimeter of square EFGH = 21 cm × 4
= **84 cm**
Area of square EFGH = 21 cm × 21 cm
= **441 cm²**

10. Since 5 cm × 5 cm = 25 cm², the length of the square is 5 cm.
Area of triangle B
→ $\frac{1}{2}$ × (5 + 7) cm × (5 + 23) cm
= **168 cm²**

Chapter 5 Ratio

Level 1

Exercise 1

1. 6 : 7 ; 7 : 6
2. 9 : 2 ; 2 : 9
3. 10 : 3 ; 3 : 10
4. (a) A □□□
B □□□□

(b) X □□□□□□□□□□
Y □□□□□

5. Chris → $5
Firdaus → $5 + $7
= $12
The ratio is **5 : 12**.

6. Sugar used → 3 kg
Sugar left → 10 kg – 3 kg
= 7 kg
The ratio is **3 : 7**.

7. (a) 3 : 1 (b) 3 : 4
(c) 2 : 5 (d) 8 : 9

8. (a) 7 × 5 = **35** (b) 36 ÷ 4 = **9**
(c) 6 × 3 = **18** (d) 12 × 10 = **120**

9. Length of shorter piece → 35 cm – 30 cm
= 5 cm
5 : 30 = **1 : 6**

10. Number of pears → (16 – 4) ÷ 2
= 6
Number of apples → 16 – 6
= 10
10 : 6 = **5 : 3**

Exercise 2

1. (a) 1 : 2 : 6 (b) 7 : 5 : 3
(c) 4 : 3 : 6 (d) 7 : 2 : 4

2. (a) **13** : **8** : 6 (b) **7** : 42 : **21**
(c) 50 : **25** : **30** (d) **55** : 10 : **35**

3. 4 : 9 : 7

4. (a) $24 : $16 → **3 : 2**
(b) $30 : $28 → **15 : 14**
(c) $30 : $24 : $16 → **15 : 12 : 8**
(d) $24 : $16 : $28 → **6 : 4 : 7**

5. (a) 4 : 10 : 6 = **2 : 5 : 3**
(b) 10 : (4 + 10 + 6) = 10 : 20
= **1 : 2**

6. Boys → 7 units
→ 42
1 unit → 42 ÷ 7
= 6
Girls → 8 units
→ 8 × 6
= **48**

7. Mark → 11 units
Lee Lee → 9 units
Difference → 2 units
→ 34 cm
1 unit → 34 cm ÷ 2
= 17 cm
9 units → 9 × 17 cm
= **153 cm**

8. Red roses → 7 units
Yellow roses → 1 unit
Total → 8 units
→ 112 roses
1 unit → 112 ÷ 8
= 14 roses

Difference → 6 units
→ 6 × 14
= **84 roses**

9. Science → 5 units
Mathematics → 9 units
→ 90 marks
1 unit → 90 ÷ 9
= 10 marks
Difference → 4 units
→ 4 × 10
= **40 marks**

*10. Flour → 5 units
Butter → 1 unit
Difference → 4 units
→ 30 g
1 unit → 30 ÷ 4
= 7.5 g
5 units → 5 × 7.5
= **37.5 g**

Level 2

Exercise 1

1. Red marbles → 3 units
→ 36
1 unit → 36 ÷ 3
= 12
Blue marbles → 2 units
→ 2 × 12
= **24**

*2. Total → 6 units + 5 units + 4 units
→ 15 units
→ $120
1 unit → $120 ÷ 15
= $8
Ian → 4 units
→ 4 × $8
= **$32**

3. Total → 5 units + 1 unit + 3 units
→ 9 units
→ 135
1 unit → 135 ÷ 9
= 15
Difference in number of stamps between Harold and Bryan
→ 5 units – 1 unit
→ 4 units
→ 4 × 15
= **60**

4. Difference in number of stickers between Julian and Kimberly
→ 12 units – 10 units
→ 2 units
→ 6
1 unit → 6 ÷ 2
= 3
Total → 12 units + 7 units + 10 units
→ 29 units
→ 29 × 3
= **87**

5. Difference in number of sweets between Abdullah and Sean
→ 4 units – 3 units
→ 1 unit
→ 12
Difference in number of sweets between Abdullah and Gopal
→ 4 units – 1 unit
→ 3 units
→ 3 × 12
= **36**

6. Difference in mass between Jane and Judy
→ 8 units – 7 units
→ 1 unit
→ 4 kg
Joyce → 11 units
→ 11 × 4 kg
= **44 kg**

7. Difference in number of cars and vans
→ 10 units – 1 unit
→ 9 units
→ 72
1 unit → 72 ÷ 9
= 8
Difference in number of cars and buses
→ 10 units – 2 units
→ 8 units
→ 8 × 8
= **64**

8. Difference in number of boys and girls
→ 3 units – 1 unit
→ 2 units
→ 6
1 unit → 6 ÷ 2
= 3
Adults → 12 units
→ 12 × 3
= **36**

9. Longest piece → 8 units
→ 48 cm
1 unit → 48 cm ÷ 8
= 6 cm
Original length of pipe
→ 1 unit + 6 units + 8 units
→ 15 units
→ 15 × 6 cm
= **90 cm**

*10. Perimeter
→ 3 units + 4 units + 5 units
→ 12 units
→ 60 cm
1 unit → 60 cm ÷ 12
= 5 cm
Difference in length between the longest side and shortest side
→ 5 units – 3 units
→ 2 units
→ 2 × 5 cm
= **10 cm**

Exercise 2

1. **(4)**
$100 – $45 = $55
$45 : $55 → 9 : 11

2. **(3)**
Number of girls → (35 + 5) ÷ 2
= 20
20 : 35 = 4 : 7

3. **(2)**
1 unit → 13 cm
5 units → 5 × 13
= 65

4. **(3)**
Difference → 1 unit
→ 99
Total → 17 units
→ 17 × 99
= 1683

5. **(3)**
The ratio is 12 : 2 : 9.

6. **(1)**
Yellow balloons → 9 units
= 54
1 unit → 54 ÷ 9
= 6
Red balloons → 5 units
→ 5 × 6
= 30

7. **(4)**
Difference in volume of water between Container A and Container C
→ 6 units – 2 units
= 4 units
= 84 *m*ℓ
1 unit → 84 ÷ 4
= 21 *m*ℓ
Container B → 7 units
= 7 × 21 *m*ℓ
= 147 *m*ℓ

8. **(2)**
Total mass → 5 units + 1 unit + 4 units
= 10 units
= 20 kg
1 unit → 20 kg ÷ 10
= 2 kg
Difference in mass between Bag B and Bag C
→ 4 units – 1 unit
= 3 units
= 3 × 2 kg
= 6 kg

9. **(2)**
Difference in number of guppies and goldfish
→ 12 units – 4 units
= 8 units
= 24
1 unit → 24 ÷ 8
= 3
Total number of fish
→ 4 units + 12 units + 1 unit
= 17 units
= 17 × 3
= 51

10. **(3)**
Difference in number of rambutan and mango trees
→ 7 units – 5 units
= 2 units
= 60
1 unit → 60 ÷ 2
= 30
Rambutan trees → 7 units
→ 7 × 30
= 210

Level 3

Exercise 1

1. Length of smaller square → 5 cm
   Length of bigger square
   → 10 cm (since 10 × 10 = 100)
   Ratio = 5 : 10
   = **1 : 2**
2. Breadth = (30 cm – 9 cm – 9 cm) ÷ 2
   = 6 cm
   Ratio = 6 : 9
   = **2 : 3**
3. Difference → 1 unit
   → 13 cm
   Length = 13 cm × 5
   = 65 cm
   Breadth = 13 cm × 4
   = 52 cm
   Perimeter = 65 cm + 52 cm + 65 cm + 52 cm
   = **234 cm**
4. Perimeter → (3 + 1 + 3 + 1) units
   = 8 units
   → 96 cm
   Breadth → 1 unit
   → 96 cm ÷ 8
   = **12 cm**
   Length → 3 units
   → 3 × 12 cm
   = **36 cm**
5. Perimeter → (2 + 1 + 2 + 1) units
   = 6 units
   → 60 cm
   Breadth → 1 unit
   → 60 cm ÷ 6
   = 10 cm
   Length → 2 units
   → 2 × 10 cm
   = 20 cm
   Area = 20 cm × 10 cm = **200 cm²**
6. 7 units → $1400
   1 unit → $1400 ÷ 7
   = $200
   Difference → 5 units
   → 5 × $200
   = $1000
   $1000 ÷ 2 = **$500**
7. 4 : 1 = 8 : 2
   Difference → 6 units
   6 units ÷ 2 = 3 units
   3 units → 30 marbles
   1 unit → 30 ÷ 3
   = 10
   Total → 10 units
   → 10 × 10
   = **100**
8. 8 : 3 = 16 : 6
   Difference → 10 units
   10 units ÷ 2 = 5 units
   5 units → 50 m*l*
   1 unit → 50 m*l* ÷ 5
   = 10 m*l*
   Volume of water in Cup A in the end = Volume of water in Cup B in the end
   → (16 + 6) units ÷ 2
   → 11 units
   → 11 × 10 m*l*
   = **110 m*l***
9. 7 units – 4 units
   = 5 units – 2 units
   = 3 units
   → 6
   1 unit → 6 ÷ 3
   = 2
   Total → 9 units
   → 9 × 2
   = **18**
10. At first, the ratio is 2 : 3 = 6 : 9.
    In the end, the ratio is 1 : 2 = 5 : 10.
    1 unit → $10
    Darren → 6 units
    → 6 × $10
    = **$60**
    Brother → 9 units
    → 9 × $10
    = **$90**

Exercise 2

1. A : B = 1 : 3 = 3 : 9
   B : C = 9 : 7
   Amount of water in Container C
   → 7 units
   → 1400 m*l*
   1 unit → 1400 m*l* ÷ 7
   = 200 m*l*

Amount of water in Container A
→ 3 units
→ 3 × 200 ml
= **600 ml**

2. Adults : Boys = 10 : 1
Adults : Girls = 5 : 2 = 10 : 4
10 units → 250
1 unit → 250 ÷ 10
= 25
Total → (10 + 1 + 4) units
→ 15 units
→ 15 × 25
= **375**

3. Shaded area : Area of ABCD = 1 : 4 = 2 : 8
Shaded area : Area of EFGH = 2 : 5
(a) Area of ABCD : Area of EFGH = **8 : 5**
(b) Unshaded area of ABCD : Unshaded area of EFGH
= (8 – 2) : (5 – 2)
= 6 : 3
= **2 : 1**

4. Albert's height : Father's height = 3 : 4 = 12 : 16
Albert's height : Mother's height = 4 : 5 = 12 : 15
(a) Mother's height : Father's height = **15 : 16**
(b) 3 units → 33 cm
1 unit → 33 cm ÷ 3
= 11 cm
16 units → 16 × 11 cm
= **176 cm**

5. Harry's money : Ryan's money
= 4 : 1
= 12 : 3 (Total → 15 units)
Aziz's money : Total of Harry and Ryan's money
= 1 : 3
= 5 : 15
(a) Aziz's money to Harry's money to Ryan's money
= **5 : 12 : 3**
(b) 5 units → $25
1 unit → $25 ÷ 5
= $5
12 units → 12 × $5
= **$60**

6. At first, the ratio is 1 : 2 = 3 : 6. (Number of boys remained unchanged.)
In the end, the ratio is 3 : 5.
Difference in number of girls
→ 6 units – 5 units
→1 unit
→ 3
Boys → 3 units
→ 3 × 3
= **9**

7. At first, the ratio is 6 : 7 = 12 : 14. (Mr Tham's money remained unchanged.)
In the end, the ratio is 1 : 2 = 7 : 14.
Difference in amount of money Mr Saw had
→ 12 units – 7 units
→ 5 units
→ $500
1 unit → $500 ÷ 5
= $100
Amount of money Mr Saw had at first
→ 12 units
→ 12 × $100
= **$1200**

8. At first, the ratio is 6 : 5 = 12 : 10. (Number of oranges remained unchanged.)
In the end, the ratio is 7 : 10.
Difference in number of apples
→ 12 units – 7 units
→ 5 units
→ 30
1 unit → 30 ÷ 5
= 6
Total number of fruits at first
→ 12 units + 10 units
→ 22 units
→ 22 × 6
= **132**

9. At first, the ratio is 10 : 3. (Number of girls remains unchanged.)
In the end, the ratio is 3 : 1 = 9 : 3
Difference in number of boys
→ 10 units – 9 units
→ 1 unit
Girls → 3 units
→ 9
1 unit → 9 ÷ 3
= **3**

10. At first, the ratio is 8 : 1. (Number of fiction books remains unchanged.)
In the end, the ratio is 2 : 1 = 8 : 4.
Difference in number of non-fiction books
→ 4 units – 1 unit
→ 3 units
Fiction books
→ 8 units
→ 1800

1 unit → 1800 ÷ 8
= 225
3 units → 3 × 225
= **675**

Chapter 6 Rate

Level 1

Exercise 1

1. (a) 250 ÷ 10 = 25
25 loaves of bread are baked in 1 h.
(b) 480 ÷ 24 = 20
20 strawberries are picked in 1 min.
(c) 1200 ÷ 60 = 20
20 buttons are sewed in 1 min.
(d) 980 ÷ 7 = 140
He sold **140** plates of carrot cake in 1 day.
(e) $60 000 ÷ 12 = $5000
Her monthly salary is **$5000**.
(f) 120 ÷ 5 = 24
He attended **24** scrabble competitions in 1 year.

2. (a) Volume of orange juice she drank in 1 day
→ 11 ÷ 10
= $\frac{11}{10}$
= $1\frac{1}{10}$ *l*
(b) Mass of rice they consumed in 1 day
→ 6 ÷ 25
= $\frac{6}{25}$ **kg**
(c) Mass of candy he can eat in 1 min
→ 50 ÷ 12
= $\frac{50}{12}$
= $\frac{25}{6}$
= $4\frac{1}{6}$ **g**
(d) Distance Mr Chou walks in 1 day
→ 16 ÷ 7
= $\frac{16}{7}$
= $2\frac{2}{7}$ **km**

Exercise 2

1. Number of patients he sees in 1 h → 24 ÷ 8
= 3
Number of patients he sees in 3 h → 3 × 3
= **9**

2. Number of chairs he can make in 1 h
→ 4 ÷ 12
= $\frac{1}{3}$
Number of chairs he can make in 6 h
→ 6 × $\frac{1}{3}$
= **2**

3. Amount of time he would take to bake 1 cupcake
= 8 ÷ 32
= $\frac{1}{4}$ h
Amount of time he would take to bake 18 cupcakes → 18 × $\frac{1}{4}$
= $\frac{18}{4}$
= $4\frac{1}{2}$ **h**

4. Amount of time Fabian takes to write 1 article
→ 84 ÷ 7
= 12 min
Amount of time Fabian takes to write 11 articles → 11 × 12
= **132 min**

5. Number of sets of 2 months in 10 months
→ 10 ÷ 2
= 5
Number of assessment books she can complete in 10 months → 5 × 5
= **25**

6. Number of toy aeroplanes it can produce in 1 h
→ 600 ÷ 3
= 200
Number of toy aeroplanes it can produce in 10 h
→ 10 × 200
= **2000**

7. Amount of time he will take to type 1 word
→ 4 ÷ 356
= $\frac{1}{89}$
Amount of time he will take to type 712 words
→ 712 × $\frac{1}{89}$
= **8 min**

8. (a) Number of bottles of shampoo it produces in 1 h → 520 ÷ 2
= 260
Number of bottles of shampoo it produces in 5 h → 5 × 260
= **1300**
(b) Amount of time it takes to produce 390 bottles of shampoo → 390 ÷ 260
= $1\frac{1}{2}$ h

9. (a) Volume of yoghurt it can produce in 1 min → 8250 ÷ 15
= 550 m*l*
Volume of yoghurt it can produce in 9 min → 9 × 550
= **4950 m*l***

(b) Amount of time it takes to produce 6600 m*l* of yoghurt → 6600 ÷ 550
= **12 min**

Level 2

Exercise 1

1. Amount of money Mrs Azman charges for a 1-h tuition session → $80 ÷ 2
= $40
Amount of money Mr Azman charges per hour for a 3-h tuition session → $40 – $5
= $35
Amount of money Mr Azman charges for a 3-h tuition session → 3 × $35
= **$105**

2. Fraction of the fence Walter would paint in 1 h → $1 \div 6$
$= \frac{1}{6}$
Fraction of the fence Eric would paint in 1 h → $1 \div 3$
$= \frac{1}{3}$
Fraction of the fence both of them would paint together in 1 h → $\frac{1}{6} + \frac{1}{3}$
$= \frac{1}{6} + \frac{2}{6}$
$= \frac{3}{6}$
Amount of time both of them would take to paint the same fence together → $1 \div \frac{3}{6}$
$= 1 \times \frac{6}{3}$
= **2 h**

3. Amount of time Luke took to colour 1 postcard → 42 ÷ 7
= 6 min
Amount of time Leia took to colour 1 postcard → 40 ÷ 4
= 10 min
Fraction of postcard Luke coloured in 1 min
= 1 ÷ 6
$= \frac{1}{6}$
Fraction of postcard Leia coloured in 1 min → $1 \div 10$
$= \frac{1}{10}$
Fraction of postcard both of them colourec together in 1 min → $\frac{1}{6} + \frac{1}{10}$
$= \frac{5}{30} + \frac{3}{30}$
$= \frac{8}{30}$
Amount of time both of them would take to colour 20 postcards together → $20 \div \frac{8}{30}$
$= 20 \times \frac{30}{8}$
= **75 min**

4. Fraction of the coding programme Yiyang and Stanley created together in 1 week → $1 \div 9$
$= \frac{1}{9}$
Fraction of the coding programme Stanley created in 1 week → $1 \div 12$
$= \frac{1}{12}$
Fraction of the coding programme Yiyang created in 1 week → $\frac{1}{9} - \frac{1}{12}$
$= \frac{4}{36} - \frac{3}{36}$
$= \frac{1}{36}$
Amount of time Yiyang would take to create the same coding programme on his own → $1 \div \frac{1}{36}$
= **36 weeks**

5. Number of pocket creatures Jeremy caught in 1 h = 144 ÷ 12
= 12
Number of pocket creatures Jessica caught in 1 h = 144 ÷ 36
= 4
Number of pocket creatures Jeremy caught more than Jessica in 1 h = 12 – 4
= **8**

6. (a) Amount of money Casheen will spend after 10 weeks = 10 × $10
= $100
Amount of money Padma will deposit after 10 weeks = 10 × $8
= $80
Amount of money Casheen has in her piggy bank after 10 weeks
= $480 – $100
= $380
Amount of money Padma has in her piggy bank after 10 weeks
= $220 + $80
= $300

Difference between their savings after 10 weeks = $380 – $300
= **$80**

(b) Using guess and check,

Number of weeks	Casheen's saving	Padma's saving	Difference between their savings	Check
20	$480 – $100 = $380	$220 + $80 = $300	$380 – $300 = $80	✗
25	$480 – (25 × $10) = $230	$220 + (25 × $8) = $420	$420 – $230 = $190	✗
(26)	$480 – (26 × $10) = $220	$220 + (26 × $8) = $428	$428 – $220 = $208	✓

Number of weeks it takes for Padma's savings to be at least $200 more than Casheen's savings = **26**

7. Fraction of the playhouse Bradley and Cooper built together in 1 day → $1 \div 8$
$= \frac{1}{8}$

Number of days Bradley and Cooper spent building the playhouse together → 4 + 2
= 6

Fraction of the playhouse Bradley and Cooper built together in 6 days → $6 \times \frac{1}{8}$
$= \frac{6}{8}$

Fraction of the playhouse Bradley built in 4 days → $1 - \frac{6}{8}$
$= \frac{2}{8}$

Fraction of the playhouse Bradley built in 1 day
→ $\frac{2}{8} \div 4$
$= \frac{2}{8} \times \frac{1}{4}$
$= \frac{1}{16}$

Number of days Bradley would take to build the playhouse by himself → $1 \div \frac{1}{16}$
= **16**

8. Duration from 10.30 a.m. to 5.30 p.m.
= 2 + 5
= 7 h

Amount of money she paid from 10.30 a.m. to 5.30 p.m. → 7 × $1.70
= $11.90

Duration from 5.30 p.m. to 7.30 p.m. = 2 h
Amount of money she paid from 5.30 p.m. to 7.30 p.m. → 2 × $2
= $4

Amount of money she paid from 7.30 p.m. to 8.15 p.m. → $2.50

Amount of money she paid for the parking in total → $11.90 + $4 + $2.50
= **$18.40**

9. (a) Amount of money she paid for the first min = $0.40
Amount of money she paid for the next 2 min = $0.70
Number of minutes left → 5 – 3
= 2
Amount of money she paid for subsequent 2 min → 2 × $0.10
= $0.20
Total amount of money Salma paid for her phone call → $0.40 + $0.70 + $0.20
= $1.30
Amount of money Salma paid for her phone call per min → $1.30 ÷ 5
= **$0.26**

*(b) Amount of money she paid for the first min → $0.40
Amount of money she paid for the next 2 min → $0.70
Number of minutes left → 32 – 3
= 29
Amount of money she paid for subsequent 29 min → 29 × $0.10
= $2.90
Total amount of money Salma paid for her phone call → $0.40 + $0.70 + $2.90
= $4
Amount of money Salma paid for her phone call per min
→ $4 ÷ 32
= $0.125
≈ **$0.13 (2 decimal places)**

(c) Amount of money Salma paid for her phone call per min on Monday more than on Saturday = $0.26 – $0.13
= **$0.13**

Exercise 2

1. **(4)**
Number of cookies Kane can bake in 1 min
→ 150 ÷ 10
= 15
Number of cookies he can bake in 15 min
→ 15 × 15
= 225

2. **(1)**
Amount of money Cassandra spent in 1 day
→ \$20 ÷ 5
= \$4
Amount of money Cassandra spent in 17 days
→ 17 × \$4
= \$68

3. **(4)**
Number of patients the dentist attends to in 1 h
→ 48 ÷ 12
= 4
Amount of time the dentist takes to attend to 16 patients → 16 ÷ 4
= 4 h

*4. **(2)**
Amount of money Marietta paid per min
→ \$16.80 ÷ 12
= \$1.40
Amount of money Adrian paid for his taxi ride
→ 20 × \$1.40
= \$28
Amount of money Adrian paid more than Marietta → \$28 – \$16.80
= \$11.20

5. **(1)**
Amount of time he takes to fry 1 plate of noodles → 12 ÷ 24
= $\frac{1}{2}$ min
Amount of time he will take to fry 16 plates of noodles → 16 × $\frac{1}{2}$
= 8 min

6. **(3)**
Number of revolutions the Singapore flyer can make in 1 min → 4 ÷ 224
= $\frac{1}{56}$
Number of revolutions it can make in 168 min
→ 168 × $\frac{1}{56}$
= 3

7. **(3)**
Volume of fruit juice she can make in 1 min
→ 4050 ÷ 45
= 90 m*l*
Volume of fruit juice she can make in 8 min
→ 8 × 90
= 720 m*l*

8. **(4)**
Fraction of the room Leon painted in 1 h → $\frac{1}{6}$
Fraction of the room Suat Ning painted in 1 h
→ $\frac{1}{12}$
Fraction of the room Leon and Suat Ning painted together in 1 h
→ $\frac{1}{6} + \frac{1}{12}$
= $\frac{2}{12} + \frac{1}{12}$
= $\frac{3}{12}$
= $\frac{1}{4}$
Amount of time both of them would take to paint the room together
→ 1 ÷ $\frac{1}{4}$
= 4 h

9. **(1)**
Fraction of the doll Delphine and Selphy sewed together in 1 week = $\frac{1}{4}$
Fraction of the doll Delphine would take to sew in 1 week on her own = $\frac{1}{12}$
Fraction of the doll Selphy would take to sew in 1 week on her own → $\frac{1}{4} - \frac{1}{12}$
= $\frac{3}{12} - \frac{1}{12}$
= $\frac{2}{12}$
= $\frac{1}{6}$
Amount of time Selphine would take to sew the same doll on her own → 1 ÷ $\frac{1}{6}$
= 6 weeks

10. **(4)**
Volume of water filled by the pump in 1 min
→ 6 ÷ 5
= $\frac{6}{5}$ *l*
Volume of water filled by the pump in 3 min
→ 3 × $\frac{6}{5}$
= $\frac{18}{5}$
= $3\frac{3}{5}$ *l*

Level 3

Exercise 1

1. Fraction of a certain number of jigsaw puzzles Fazilah can complete in 1 day = $\frac{1}{5}$
Fraction of a certain number of jigsaw puzzles Amirul can complete in 1 day = $\frac{1}{7}$
Fraction of a certain number of jigsaw puzzles Fazilah can complete more than Amirul in 1 day = $\frac{1}{5} - \frac{1}{7}$
$= \frac{7}{35} - \frac{5}{35}$
$= \frac{2}{35}$
$\frac{2}{35}$ of the jigsaw puzzles → 4
$\frac{1}{35}$ of the jigsaw puzzles → 4 ÷ 2
= 2
$\frac{35}{35}$ of the jigsaw puzzles → 35 × 2
= 70
Number of jigsaw puzzles Fazilah can complete in 5 days = 70
Number of jigsaw puzzles Fazilah can complete in 1 day = 70 ÷ 5
= 14
Number of jigsaw puzzles Fazilah can complete in 10 days = 10 × 14
= **140**

2. Fraction of the toy Li Na and Jin Yee could fix in 1 h = $\frac{1}{2}$
Fraction of the toy Jin Yee and Patricia could fix in 1 h = $\frac{1}{4}$
Fraction of the toy Li Na and Patricia could fix in 1 h = $\frac{1}{3}$
Fraction of the toy 2 Li Na, 2 Jin Yee and 2 Patricia could fix in 1 h = $\frac{1}{2} + \frac{1}{4} + \frac{1}{3}$
$= \frac{13}{12}$
Fraction of the toy Li Na, Jin Yee and Patricia could fix in 1 h → $\frac{13}{12} \div 2$
$= \frac{13}{12} \times \frac{1}{2}$
$= \frac{13}{24}$
Amount of time it would take all three girls to fix the same toy together = $1 \div \frac{13}{24}$
$= 1 \times \frac{24}{13}$
$= 1\frac{11}{13}$ **h**

3. Volume of orange juice filled after 5 s
→ 5 × 20
= 100 m*l*
Volume of orange juice poured into the flask per second → 20 + 25
= 45 m*l*
Volume of orange juice left to be filled after 5 s
→ 1000 – 100
= 900 m*l*
Amount of time needed to fill the flask after 5 s
→ 900 ÷ 45
= 20 s
Amount of time it would take for the flask to be fully filled → 20 + 5
= **25 s**

4. Amount of money it will cost 1 pupil for the camp → \$900 ÷ 30
= \$30
Most number of pupils who can attend the camp → \$1250 ÷ \$30
= 41.66
≈ **41 (round down)**

5. Fraction of the pool tap A and tap B can fill in 1 h → $\frac{1}{4}$
Fraction of the pool tap B can fill in 1 h
→ $\frac{1}{4} \div 3$
$= \frac{1}{4} \times \frac{1}{3}$
$= \frac{1}{12}$
Amount of time it will take to fill the pool if only tap B is turned on = $1 \div \frac{1}{12}$
= **12 h**

6. Fraction of the car Jordan can repair in 1 h → $\frac{1}{6}$
Fraction of the car Michael can repair in 1 h → $\frac{1}{8}$
Fraction of the car Jordan and Michael can repair together in 1 h → $\frac{1}{6} + \frac{1}{8}$
$= \frac{4}{24} + \frac{3}{24}$
$= \frac{7}{24}$
Fraction of the car Jordan and Michael can repair together in 2 h → $2 \times \frac{7}{24}$
$= \frac{14}{24}$
$= \frac{7}{12}$

Fraction of the car Michael has to repair after Jordan left → $1 - \frac{7}{12}$

$= \frac{5}{12}$

Amount of time it will take for Michael to repair the car after Jordan left

→ $\frac{5}{12} \div \frac{1}{8}$

$= \frac{5}{12} \times 8$

$= 3\frac{1}{3}$ **h**

7. Fraction of the art project Shantini completes in 1 min → $\frac{1}{90}$

Fraction of the art project Anthoni completes in 1 min → $\frac{1}{120}$

Fraction of the art project Shantini and Anthoni completes together in 1 min

→ $\frac{1}{90} + \frac{1}{120}$

$= \frac{4}{360} + \frac{3}{360}$

$= \frac{7}{360}$

Fraction of the art project Shantini and Anthoni completes together in 30 min

→ $\frac{\cancel{30}}{1} \times \frac{7}{\cancel{360}_{12}}$

$= \frac{7}{12}$

Fraction of the art project left to be completed

→ $1 - \frac{7}{12}$

$= \frac{5}{12}$

Fraction of the art project Shantini, Anthoni and Li Sha completes together in 1 min

→ $\frac{5}{12} \div 20$

$= \frac{\cancel{5}}{\cancel{12}} \times \frac{1}{\cancel{20}_{4}}$

$= \frac{1}{48}$

Fraction of the art project Li Sha completes in 1 min $= \frac{1}{48} - \frac{7}{360}$

$= \frac{15}{720} - \frac{14}{720}$

$= \frac{1}{720}$

Amount of time it will take for Li Sha to complete the art project on her own

→ $1 \div \frac{1}{720}$

= 720 min

8. Fraction of the room both of them painted in 1 h → $\frac{1}{2}$

Using guess and check,

Number of hours Leonora used to paint the room on her own	Fraction of the room painted in 1 h	Number of hours April used to paint the room on her own	Fraction of the room painted in 1 h	Fraction of the room both of them painted in 1 h	Check
4	$\frac{1}{4}$	1	1	$\frac{1}{4} + 1 = 1\frac{1}{4}$	✗
5	$\frac{1}{5}$	2	$\frac{1}{2}$	$\frac{1}{5} + \frac{1}{2} = \frac{7}{10}$	✗
6	$\frac{1}{6}$	③	$\frac{1}{3}$	$\frac{1}{6} + \frac{1}{3} = \frac{1}{2}$	✓

April will take **3 h** to paint the room on her own.

9. Fraction of the robot toy 4 children can assemble in 1 day → $\frac{1}{12}$

Fraction of the robot toy 1 child can assemble in 1 day → $\frac{1}{12} \div 4$

$= \frac{1}{12} \times \frac{1}{4}$

$= \frac{1}{48}$

Fraction of the robot toy 1 child can assemble in 16 days → $16 \times \frac{1}{48}$

$= \frac{16}{48}$

$= \frac{1}{3}$

Number of children needed to assemble the robot toy in 16 days → $1 \div \frac{1}{3}$

= 3

Exercise 2

1. Volume of water tap A will fill in 2 min

→ 2×8

$= 16\ l$

Volume of water left to be filled

→ $132 - 12$

$= 120\ l$

Volume of water tap A and tap B will fill in 1 min → $8 + 12$

$= 20\ l$

Amount of time she will take to fill the bath tub after tap A has been turned on for 2 min → $120 \div 20$

$= 6$ min

Amount of time she will take to fill the bath tub in total → 2 + 6
= **8 min**

2. Number of key chains 1 machine can produce in 1 min → 630 ÷ 9
= 70
Number of key chains 1 machine can produce in 7 min → 7 × 70
= 490
Number of key chains 21 such machines can produce in 7 min → 21 × 490
= **10 290**

3. Number of pages printer A could print in 1 min
→ 500 ÷ 5
= 100
Number of pages printer B could print in 1 min
→ 80 ÷ 4
= 20
Number of pages printer A and printer B could print together in 1 min → 100 + 20
= 120
Number of pages printer A printed in 6 min
→ 6 × 100
= 600
Number of pages left to be printed
→ 7500 – 600
= 6900
Amount of time it would take both printers to print 6900 pages altogether = 6900 ÷ 120
= 57.5 min
Amount of time it would take both printers to print 7500 pages altogether = 6 + 57.5
= **63.5 min**

4. Volume of water tap A fills in 1 min
→ 90 ÷ 3
= 30 *l*
Volume of water tap B drains in 1 min
→ 40 ÷ 4
= 10 *l*
Volume of water tap A fills in 2 min
→ 2 × 30
= 60 *l*
Volume of water filled with both tap A and tap B turned on in 1 min = 30 – 10
= 20 *l*
Volume of water left to be filled
→ 380 – 60
= 320 *l*
Amount of time it will take to fill the pool with 320 *l* of water → 320 ÷ 20
= 16 min
Amount of time it will take to fill the pool with 380 *l* of water → 2 + 16
= **18 min**

5. Number of packets of biscuits machine C can produce in 1 min → 45 ÷ 5
= 9
Number of packets of biscuits machine D can produce in 1 min → 20 ÷ 4
= 5
Number of packets of biscuits machine C produces in 10 min → 10 × 9
= 90
Number of packets of biscuits machine C and machine D produce altogether in 1 min
→ 9 + 5
= 14
Number of packets of biscuits machine C and machine D will produce altogether in 70 min
→ 70 × 14
= 980
Number of packets of biscuits both machines will produce altogether after 70 min
→ 90 + 980
= **1070**

6. Volume of water filled by hose A after 20 min
→ 20 × 15
= 300 *l*
Volume of water drained in 1 min when both hose A and hose B are turned on
→ 25 – 15
= 10 *l*
Amount of time it will take for the tank to be completely drained of water after hose B has been turned on → 300 ÷ 10
= **30 min**

7. Volume of water tap X fills in 15 min
→ 15 × 40
= 600 *l*
Volume of water left to be filled → 900 – 600
= 300 *l*
Volume of water that will be filled in 1 min when both tap X and tap Y are turned on
→ 40 – 25
= 15 *l*
Amount of time it will take to fill the pool with 300 *l* of water → 300 ÷ 15
= 20 min

Amount of time it will take to fill the pool with 900 ℓ of water → 15 + 20
= **35 min**

8. First 20 paintballs → $8
Next 30 paintballs → $9
Remaining number of paintballs
→ 175 – 20 – 30
= 125
Number of groups of 10 in 125
= 125 ÷ 10
= 12.5
≈ 13 (round up)
Amount of money Parvati has to pay for the remaining 125 paintballs → 13 × $2
= $26
Amount of money she had to pay in total
→ $8 + $9 + $26
= **$43**

9. (a) First 2 h → $300
Next 1 h → $120
Additional 2 h → 2 × $80
= $160
Amount of money she paid for the function room → $300 + $120 + $160
= **$580**

(b) Amount of money Robert paid
→ $580 + $270
= $850
First 2 h → $400
Next 1 h → $150
Amount of money paid for additional hours → $850 – $400 – $150
= $300
Number of additional hours he could use the function room for → $300 ÷ $100
= 3
Maximum amount of time he could use the function room for → 2 + 1 + 3
= **6 h**

Chapter 7 Decimals

Level 1

Exercise 1

1. (a) $0.075 = \frac{75}{1000}$
$= \frac{3}{40}$

(b) $0.875 = \frac{875}{1000}$
$= \frac{7}{8}$

(c) $3.4 = 3\frac{4}{10}$
$= 3\frac{2}{5}$

(d) $14.36 = 14\frac{36}{100}$
$= 14\frac{9}{25}$

2. (a) 2600 ÷ 2.6 = **1000**
(b) 10.05 ÷ 1.005 = **10**
(c) 3 ÷ 100 = **0.03**
(d) 970 ÷ 1000 = **0.97**

3. (a) 0.4 × 60 = 0.4 × **6** × 10 = **2.4** × 10 = **24**
(b) 1.28 × 30 = **1.28** × 3 × 10 = **3.84** × 10 = **38.4**
(c) 0.74 × 200 = **0.74** × **2** × 100 = **1.48** × 100
= **148**
(d) 3.35 × 6000 = **3.35** × 6 × 1000
= **20.1** × 1000 = **20 100**

4. (a) 650 ÷ 6.5 = **100**
(b) 7.04 ÷ 0.704 = **10**
(c) 0.016 × 1000 = **16**
(d) 30.8 × 10 = **308**

5. (a) 16 ÷ 40 = 16 ÷ **10** ÷ **4** = **1.6** ÷ **4** = **0.4**
(b) 2.07 ÷ 90 = **2.07** ÷ **10** ÷ **9** = **0.207** ÷ **9**
= **0.023**
(c) 91.2 ÷ 300 = **91.2** ÷ **100** ÷ **3** = **0.912** ÷ **3**
= **0.304**
(d) 1680 ÷ 8000 = **1680** ÷ **1000** ÷ **8** = **1.68** ÷ **8**
= **0.21**

*6. (a) $1201.10 (b) 23.9 cm
(c) 164.65 kg (d) $6.85

7. (a) 43 (b) 609
(c) 210.5 (d) 2870

8. (a) **1 m 74 cm** (b) **5 m 60 cm**
(c) **84 m 20 cm** (d) **29 m 7 cm**

9. (a) 365 (b) 4500
(c) 21 730 (d) 7010

10. (a) **2 km 351 m** (b) **3 km 40 m**
(c) **34 km 9 m** (d) **8 km 100 m**

Exercise 2

1. (a) 90 (b) 3800
(c) 27 069 (d) 9390

2. (a) **4 kg 126 g** (b) **3 kg 30 g**
(c) **30 kg 300 g** (d) **19 kg 107 g**

3. (a) 802 (b) 3700
(c) 5404 (d) 17 290

4. (a) **1 ℓ 210 mℓ** (b) **12 ℓ 10 mℓ**
(c) **20 ℓ 900 mℓ** (d) **8 ℓ 355 mℓ**

5. (a) 0.08 (b) 2.01
(c) 3.5 (d) 0.507

6. (a) 0.054 (b) 0.804
   (c) 4.03 (d) 10.1
7. (a) 2.3 (b) 0.016
   (c) 1.206 (d) 40.05
8. (a) 0.045 (b) 1.04
   (c) 2.006 (d) 1.58
9. (a) **60** cm (b) **2** km **720** m
   (c) **6** kg **16** g (d) **5570** m*l*
10. (a) 2.4 (b) 1.25
    (c) 0.73 (d) 21.09

Level 2

Exercise 1

1. 10 units → 71.5
   1 unit → 71.5 ÷ 10
   = **7.15**
   9 units → 7.15 × 9
   = **64.35**
2. 20 × $12.50 = $250
   30 × $8.75 = $262.50
   $262.50 + $250 = **$512.50**
3. 600 *l* ÷ 800 = **0.75 *l***
4. $0.65 × 3000 = **$1950**
5. 600 × 20.25 kg = **12 150 kg**

*6. 2.4 m + 1.69 m + 2.125 m
= 6.215 m
≈ **6.22 m**

7. 4.4 m = 440 cm
   440 cm ÷ 8 = **55 cm**
8. 11 *l* = 11 000 m*l*
   11 000 m*l* ÷ 40 = **275 m*l***
9. 165 cm = 1.65 m
   8.2 m − 1.65 m = **6.55 m**
10. 70 × 235 g = 16 450 g
    = **16 kg 450 g**

Exercise 2

1. **(1)**
   18.6 m ÷ 300 = 0.062 m
2. **(2)**
   0.004 × 500 = 2
3. **(2)**
   350.6 cm^2 ÷ 20 cm = 17.53
4. **(1)**
   0.07 cm × 500 = 35 cm

*5. **(4)**
$1.08 \text{ kg} + 490 \text{ g} + 1\frac{2}{7} \text{ kg}$
=1080 g + 490 g + 1285.71
= 2855.71 g
≈ 2856 g

*6. **(2)**
Difference → 11 units − 1 unit
= 10 units
→ 19.5
1 unit → 19.5 ÷ 10
= 1.95
11 units → 11 × 1.95
= 21.45

*7. **(3)**
1.6 *l* = 1600 m*l*
1600 m*l* ÷ 275 m*l* = 5.81
≈ 6

8. **(2)**
70 km 40 m = 70 km + 0.04 km
= 70.04 km

9. **(1)**
2 m 9 cm = 200 cm + 9 cm
= 209 cm

10. **(2)**
$\frac{1}{2}$ × 50 cm × 18.25 cm = 456.25 cm^2

Level 3

Exercise 1

1. 1.55 cm × 80 = 124 cm
   = **1.24 m**
2. 450 m × 7 = 3150 m
   = **3 km 150 m**
3. 750 m*l* = 0.75 *l*
   0.75 *l* + 0.45 *l* = 1.2 *l*
   1.2 *l* + 0.75 *l* = **1.95 *l***
4. 201.25 m × 60 = 12 075 m
   = **12.075 km**
5. 2400 g = 2.4 kg
   69.7 kg + 2.4 kg = 72.1 kg
   72.1 kg ÷ 2 = **36.05 kg**

*6. 12 units → $55.80
1 unit → $55.80 ÷ 12
= $4.65
13 units → $4.65 × 13
= **$60.45**

*7. $1505 − $201.40 = $1303.60
$1303.60 ÷ 2 = **$651.80**

*8. $2.50 × 9 = $22.50
$72 – $22.50 = $49.50
Cost of 1 pie → $49.50 ÷ 22
= $2.25
Cost of 1 cake → $2.25 + $2.50
= **$4.75**

*9. 134.9 kg ÷ 19 = 7.1 kg
11 × 7.1 kg = 78.1 kg
≈ **78 kg**

*10. Ian's bag → 850 g
Javier's bag → 850 g × 2
= 1700 g
Dickson's bag → 1700 g × 5
= 8500 g
= **8 kg 500 g**

Exercise 2

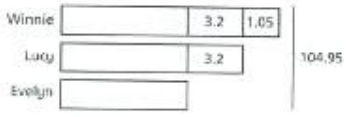
*1. 25 m ÷ 18 = 1.389 m
≈ **1.4 m**

*2. 18 *l* – 4 *l* = 14 *l*
= 14 000 m*l*
14 000 m*l* ÷ 55 = 254.545 m*l*
≈ **255 m*l***

3. 1 *l* – 300 m*l* = 700 m*l*
Every 1 *l* of orange juice needs 700 m*l* of water.
In 15 *l* of orange juice, amount of water
→ 700 m*l* × 15
= 10 500 m*l*
= **10 *l* 500 m*l***

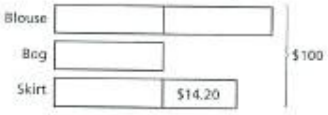
4. 1.8 kg = 1800 g
3450 g + 1800 g = 5250 g
5250 g ÷ 2 = **2625 g**

*5.



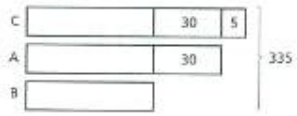
104.95 kg – 3.2 kg – 3.2 kg – 1.05 kg = 97.5 kg
Evelyn's mass → 97.5 kg ÷ 3
= 32.5 kg
Lucy's mass → 32.5 kg + 3.2 kg
= **35.7 kg**

*6.



$100 – $14.20 = $85.80
Cost of bag → $85.80 ÷ 4
= $21.45
Cost of skirt → $21.45 + $14.20
= $35.65
Cost of blouse → 2 × $21.45
= $42.90
Difference → $42.90 – $35.65
= **$7.25**

7.



3.35 m = 335 cm
335 cm – 30 cm – 30 cm – 5 cm = 270 cm
String B → 270 cm ÷ 3
= 90 cm
String C → 90 cm + 30 cm + 5 cm
= 125 cm
= **1 m 25 cm**

8. 650 g = 0.65 kg
4.07 kg + 0.65 kg = 4.72 kg
Mass of Mickey's luggage
→ 4.72 kg ÷ 2
= **2.36 kg**

9. 3 units → 59.4
1 unit → 59.4 ÷ 3
= 19.8
10 units → 10 × 19.8
= **198**

10. 7 units → 78.75
1 unit → 78.75 ÷ 7
= 11.25
8 units → 8 × 11.25
= **90**

Semestral Assessment 1

Specimen 1

PAPER 1 Booklet A

1. **(4)**
4 100 260 written in words is four million, one hundred thousand, two hundred and sixty.

2. **(1)**
$\frac{1}{2} = \frac{3}{6} = \frac{5}{10} = \frac{7}{14} = \frac{11}{22}$
Option (1) : $\frac{5}{11} = \frac{10}{22}$ is less than $\frac{1}{2}$. (✓)
Option (2) : $\frac{4}{7} = \frac{8}{14}$ is more than $\frac{1}{2}$. (✗)
Option (3) : $\frac{3}{5} = \frac{6}{10}$ is more than $\frac{1}{2}$. (✗)
Option (4) : $\frac{2}{3} = \frac{4}{6}$ is more than $\frac{1}{2}$. (✗)

3. **(3)**
$14 : (14 + 26) = 14 : 40$
$= 7 : 20$

4. **(2)**
$\frac{6}{7} \times \frac{4}{9} = \frac{24}{63}$
$= \frac{8}{21}$

5. **(1)**
$2 \times 4 = 8$

6. **(3)**
The base is 4 cm and the height is 7 cm.

7. **(4)**
Time taken to walk 1 km → $30 \div 2$
$= 15$ min
$6 \times 15 = 90$ min

8. **(4)**
$180° - 90° - 25° = 65°$

9. **(2)**
5 units → 30 marbles
1 unit → $30 \div 5$
$= 6$ marbles

10. **(1)**
$2\frac{1}{10} - 1\frac{4}{5} = 2\frac{1}{10} - 1\frac{8}{10}$
$= 1\frac{11}{10} - 1\frac{8}{10}$
$= \frac{3}{10}$

11. **(2)**
Ms Low → $2 \times \$50$
$= \$100$
Ms Low and Ms Gan → $\$100 + \$50$
$= \$150$
Ms Koh → $3 \times \$150$
$= \$450$
Total → $\$150 + \$450$
$= \$600$

12. **(3)**
2 units → 90
1 unit → $90 \div 2$
$= 45$
9 unit → 45×9
$= 405$

13. **(4)**
2 lengths + 2 breadths → 32 cm
1 length + 1 breadth → 16 cm
1 length → (16 cm + 4 cm) ÷ 2
$= 10$ cm
1 breadth → (16 cm − 4 cm) ÷ 2
$= 6$ cm
$10 : 6 = 5 : 3$

14. **(3)**
$1 - \frac{5}{6} = \frac{1}{6}$
$1 - \frac{2}{5} = \frac{3}{5}$
$\frac{1}{6} \times \frac{3}{5} = \frac{1}{10}$
The ratio is 10 : 1.

15. **(2)**
$9 \times \$1.75 = \$15.75$
$\approx \$16$
$\$16 \div \$2 = 8$

PAPER 1 Booklet B

16. Number of patients she sees in 1 h
→ $8 \div 2$
$= 4$
$5 \times 4 = \mathbf{20}$

17. $\$10.15 \div 7 = \mathbf{\$1.45}$

18. $5\frac{4}{7} = \frac{39}{7}$

19. $10 : 15 = 30 : 45$
$= \mathbf{6 : 9}$

20. $3\frac{1}{10} + 4\frac{5}{8} = 3\frac{4}{40} + 4\frac{25}{40}$
$= 7\frac{29}{40}$

21. $(2644 + 456) \div 2 = \mathbf{1550}$

22. +0.1 +0.1 +0.1
0.2 , 1.1 , 0.3 , 1.0 , 0.4 , **0.9** , 0.5 , 0.8
−0.1 −0.1 −0.1

23. Difference → 6 units
→ 48
1 unit → $48 \div 6$
$= 8$
Cars → 7 units
$= 7 \times 8$
$= \mathbf{56}$

24. $372 - 8 \times (51 \div 3) = 372 - 8 \times 17$
$= 372 - 136$
$= \mathbf{236}$

25. **Stadium**

26. $\frac{1}{2} \times (21 - 10) \times 12 = \frac{1}{2} \times 11 \times 12$
$= \mathbf{66}$

27. Bag → $\frac{1}{6}$

Book → $\frac{5}{6} \times \frac{1}{10}$

$= \frac{5}{60}$

Left → $1 - \frac{1}{6} - \frac{5}{60}$

$= 1 - \frac{10}{60} - \frac{5}{60}$

$= \frac{45}{60}$

$= \frac{3}{4}$

28. Since 8 cm × 8 cm = 64 cm²

Length of square → 8 cm

Perimeter of square → 8 cm × 4

= 32 cm

29. $1 - \frac{2}{3} - \frac{1}{4} = 1 - \frac{8}{12} - \frac{3}{12}$

$= \frac{1}{12}$

$\frac{1}{12} \times 48 = 4$

30. Number of bags → 2536 ÷ 8

= 317

Amount received → 317 × $3

= $951

PAPER 2

1. Number of chairs in the first 15 rows

→ 15 × 35

= 525

Number of chairs from the 16th row onwards

→ 705 – 525

= 180

Number of rows from the 16th row onwards

→180 ÷ 20

= 9

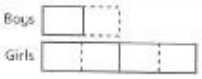
Total number of rows of chairs

→9 + 15

= 24

2. $23.25 × 2 = $46.50

$46.50 ÷ 3 = **$15.50**

3. 

Boys → 1 unit

Girls → 4 units

Children → 5 units

Ratio = **1 : 5**

4. Fraction of money left

→ $1 - \frac{5}{6} - (\frac{1}{6} \times \frac{1}{3})$

$= 1 - \frac{5}{6} - \frac{1}{18}$

$= \frac{2}{18}$

→ $9

Bag → $\frac{5}{6} = \frac{15}{18}$

Book → $\frac{1}{18}$

Difference → $\frac{14}{18}$

= $9 × 7

= $63

5. Area of big triangle

→ $\frac{1}{2} \times (3 + 5) \times (4 + 2)$

$= \frac{1}{2} \times 8 \times 6$

= 24 cm²

Area of small triangle

→ $\frac{1}{2} \times 5 \times 4$

= 10 cm²

Area of shaded part

→ 24 – 10

= 14 cm²

6.

Number of $5 notes	Value of $5 notes	Number of $10 notes	Value of $10 notes	Total value of all notes	Check
1	$5	4	$40	$45	✗ (too little)
5	$25	8	$80	$105	✗ (closer but need more $5 notes)
10	$50	13	$130	$180	✗ (too many $5 notes)
9	$45	12	$120	$165	✓

She had **12** $10 notes.

7. Area of big triangle

→ $\frac{1}{2} \times 22 \times 10$

= 110 cm²

Area of small triangle

→ $\frac{1}{2} \times 7 \times 7$

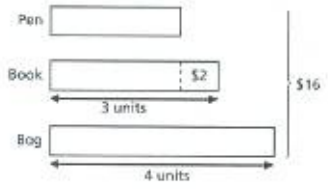
= 24.5 cm²

Area of shaded part

→ 110 – 24.5

= 85.5 cm²

8.



3 units + 3 units + 4 units → $16 + $2
10 units → $18
1 unit → $18 ÷ 10
= $1.80
4 units → 4 × $1.80
= **$7.20**

9.

1 unit → $82 – $50
= $32
$50 – $32 = **$18**

10. (a) 16 + 4 = 20
3 + 17 + 16 + 4 = 40
$\frac{20}{40} = \frac{1}{2}$

(b) 17 + 16 = 33
3 : 33 = **1 : 11**

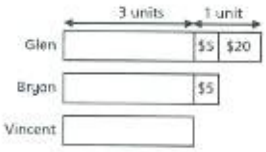
11. Jimmy's height → $\frac{2}{3} \times 150$
= 100 cm
Issac's height → $\frac{7}{8} \times 100$
= **87.5 cm**

12. Difference between Ben and Mark
→ 60 – 49
= 11
37 – 11 = 26
Ben → 26 ÷ 2
= 13
Mark → 13 + 11
= 24
Jack → 49 – 13
= 36
Sum → 13 + 24 + 36
= **73**

13. 4 mangoes + 4 watermelons
→ $4.30 × 4
= $17.20
1 watermelon
→ $17.20 – $16.10
= $1.10
1 mango
→ $4.30 – $1.10
= $3.20
Difference in cost between 1 mango and 1 watermelon
→ $3.20 – $1.10
= **$2.10**

14. At first,
Apples → 5 units
→ 10 units
Oranges → 3 units
→ 6 units
In the end,
Apples → 1 unit
→ 3 units
Oranges → 2 units
→ 6 units
→ 12
1 unit → 12 ÷ 6
= 2
10 units – 3 units = 7 units
→ 7 × 2
= **14**

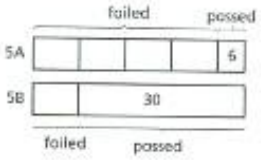
15.



1 unit → $20 + $5
= $25
Glen → 4 units
→ 4 × $25
= $100
Vincent → 3 units
→ 3 × $25
= $75
Bryan → 3 units + $5
→ $75 + $5
= $80
100 : 80 : 75 = **20 : 16 : 15**

16. At first,
Eddy → 5 units
Derrick → 9 units
In the end,
Eddy → 1 unit
→ 3 units
Derrick → 3 units
→ 9 units
5 units – 3 units = 2 units
→ $15
1 unit → $15 ÷ 2
= $7.50
5 units → 5 × $7.50
= **$37.50**

17.



(a) 3 units → 30 – 6
= 24
1 unit → 24 ÷3
= 8
5B:
Passed → 30
Failed → 8
$\frac{8}{38} = \frac{4}{19}$

(b) 5A:
Passed → 6
Failed → 4 × 8
= 32
6 : 32 = **3 : 16**

(c) 38 + 38 = **76**

Specimen 2

PAPER 1 Booklet A

1. **(4)**
$\frac{2}{5} \div 4 = \frac{2}{5} \times \frac{1}{4}$
$= \frac{2}{20}$
$= \frac{1}{10}$

2. **(3)**
5 030 172 – 5 000 000 – 100 – 70 – 2 = 30 000

3. **(2)**
6 : 8 = 3 : 4
= 9 : 12

4. **(4)**
Factors of 32 : 1, 2, ④, 8, 16, 32.

5. **(2)**
64 × 1000 = 64 000
64 × 20 × 50 = 64 000

6. **(3)**
$\frac{1}{2} \times 6 \times 9 = 27$

7. **(1)**
$4\frac{1}{2} - 1\frac{2}{3} = 4\frac{3}{6} - 1\frac{4}{6}$
$= 3\frac{9}{6} - 1\frac{4}{6}$
$= 2\frac{5}{6}$

8. **(4)**
108 – 90 ÷ 6 × 2 + 15
= 108 – 15 × 2 + 15
= 108 – 30 + 15
= 78 + 15
= 93

9. **(3)**

10. **(2)**
200 – 80 = 120
80 : 120 = 2 : 3

11. **(3)**
Length → 60 ÷ 5
= 12 cm
Perimeter → (12 + 5) × 2
= 34 cm

12. **(2)**
$703 × 2 = $1406
$1406 + $1998 = $3404

13. **(3)**
Difference → 3 units
→ 210
1 unit → 210 ÷ 3
= 70
7 units → 7 × 70
= 490

14. **(4)**
4 units → $120
1 unit → $120 ÷ 4
= $30
Difference → 3 units
→ 3 × $30
= $90
$90 ÷ 2 = $45

15. **(4)**
$1\frac{2}{5} + 1\frac{1}{4} + 1\frac{1}{5} = 1\frac{8}{20} + 1\frac{5}{20} + 1\frac{4}{20}$
$= 3\frac{17}{20}$

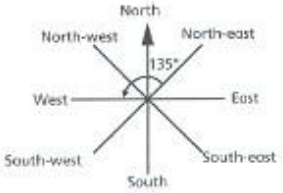
PAPER 1 Booklet B

16. Nine million, ninety thousand and nineteen
= **9 090 019**

17. 6 : 3 : 27 = **2 : 1 : 9**

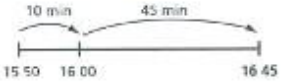
18. 8 divisions = 6 – 4
= 2
1 division = 2 ÷ 8
= $\frac{1}{4}$
$4 + (5 \times \frac{1}{4}) = 4 + \frac{5}{4}$
= $5\frac{1}{4}$

19. **West**



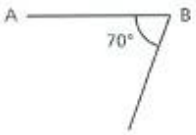
20. $3\frac{1}{2} = 3\frac{2}{4}$
= $\frac{14}{4}$
= **14** quarters

21. 300 × 50 = **15 000**

22. 

23. Adults → 3 units
→ 30
1 unit → 30 ÷ 3
= 10
Total → 8 units
→ 8 × 10
= **80**

24. Height → 6 cm
Base → 12 cm
Area → $\frac{1}{2}$ × 6 × 12 = **36** cm²

25. 

26. $1 + \frac{1}{4} + \frac{1}{50} = 1 + 0.25 + 0.02$
= **1.27**

27. Oranges → $(1 - \frac{1}{4}) \times \frac{1}{3}$
= $\frac{1}{4}$
Mangoes → $1 - \frac{1}{4} - \frac{1}{4}$
= $\frac{1}{2}$

28. Difference → 2 units
→ 11.6 kg
1 unit → 11.6 ÷ 2
= 5.8 kg
Chris → 7 units
→ 7 × 5.8
= **40.6** kg

29. $\frac{1}{3} \times 36 = 12$
$\frac{3}{4}$ of B = 12
B = $12 \times \frac{4}{3}$
= **16**

30. X = **8**; Y = **5**; Z = **7**

$$\begin{array}{r} 2\ 8\ 5\ 7 \\ \times \quad\quad 3 \\ \hline 8\ 5\ 7\ 1 \end{array}$$

PAPER 2

1. Red team → 215 – 12
= 203
Blue team → 203 – 49
= 154
Difference between Green team and Blue team
→ 215 – 154
= **61**

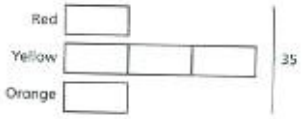
2. $\frac{1}{4}$ of rectangle ABCD is shaded.

3. 6 units + 1 unit + 4 units = 11 units
11 units → 264 kg
1 unit → 264 kg ÷ 11
= 24 kg
Difference → 2 units
→ 2 × 24 kg
= **48** kg

4. 60 = 29 + 31
29 × 31 = **899**

5. **10.049** ≈ 10.0 (1 decimal place)

6.



5 units → 35
1 unit → 35 ÷ 5
= 7
2 units → 2 × 7
= **14**

7. (a) Goats → 1 unit
Ducks → 4 units
Chickens → 6 × 4 units
= 24 units
Ratio = **24 : 1**

(b) Ducks → 4 units
= 60
1 unit → 60 ÷ 4
= 15
Total → 1 unit + 4 units + 24 units
→ 29 units
= 29 × 15
= **435**

8. 5 balls → $38.90 – $3.20 – $3.20
= $32.50
1 ball → $32.50 ÷ 5
= $6.50
$6.50 + $3.20 = **$9.70**

9. (a) Sally's age two years ago
→ 30 – 1 – 2
= 27 years
Brother's age two years ago
→ 27 ÷ 3
= 9 years
Brother's age now
→ 9 + 2
= **11 years**

(b) Brother's age next year
→ 11 + 1
= 12 years
Ratio = 30 : 12
= **5 : 2**

10. Betty → 3 units
→ $240
1 unit → $240 ÷ 3
= $80
Jermaine → 5 units
→ 5 × $80
= $400
Shu Min → $400 – $50
= $350
Total → $240 + $400 + $350
= **$990**

11. Volume of water filled per min when both taps are turned on = 6 + 5
= 11 *l*
Time it will take for bath tubs to be filled with 132 *l* of water
= 132 ÷ 11
= **12 min**

12. (a) A → 7 units
B → 12 units
B : (A + C) = 4 : 5
= 12 : 15
A + C → 15 units
C → 15 units – 7 units
= 8 units
Ratio = **7 : 12 : 8**

(b) 8 units → 16
1 unit → 16 ÷ 8
= 2
Total → 7 units + 12 units + 8 units
= 27 units
= 27 × 2
= **54**

13.

Length of BEGH (cm)	Area of BEGH (cm²)	Length of CDEF (cm)	Area of CDEF (cm²)	Difference in areas (cm²)	Check
2	4	1	1	3	✗ (too little)
3	9	2	4	5	✓

$\frac{1}{2}$ × 8 cm × 5 cm = 20 cm²
20 cm² – 9 cm² – 4 cm² = **7 cm²**

14. 6.5 cm + 12 cm + 6.5 cm = 25 cm
9 cm + 12 cm + 9 cm = 30 cm
Area of rectangular cardboard
→ 25 cm × 30 cm
= 750 cm²
Area of square
→12 cm × 12 cm
= 144 cm²
Area of remaining cardboard
→ 750 cm² – 144 cm²
= **606 cm²**

15. (a) $40 + 8 = \mathbf{48}$
(b) 4 units → 48
1 unit → $48 \div 4$
$= 12$
2 units → 2×12
$= \mathbf{24}$
(c) $12 - 8 = \mathbf{4}$
(d) $\frac{4}{40} = \frac{1}{10}$

16. 10 years ago,
Kim → 1 unit
→ 4 units
Cousin → 4 units
→ 16 units
Now,
Kim → 3 units
→ 9 units
Cousin → 7 units
→ 21 units
9 units – 4 units = 5 units
→ 10 years
1 unit → $10 \div 5$
$= 2$ years
9 units → 9×2
$= 18$ years
$18 + 2 = \mathbf{20}$

17. (a)

Sentence number	Addition sentence	Answer	Answer as a product of two identical numbers
1	1 + 1	4	2 × 2
2	1 + 3 + 5	9	3 × 3
3	1 + 3 + 5 + 7	16	4 × 4
4	1 + 3 + 5 + 7 + 9	25	5 × 5
5	1 + 3 + 5 + 7 + 9 + 11	36	6 × 6

(b) Addition sentence:
1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17
Answer = **81**
(c) $144 = 12 \times 12$
$12 - 1 = \mathbf{11}$
(d) $50 \times 50 = \mathbf{2500}$

Chapter 8 Average

Level 1

Exercise 1

1. (a) $12 + 27 + 30 + 67 + 100 = 236$
$236 \div 5 = \mathbf{47.2}$
(b) $\$6 + \$8 + \$20 + \$9 = \$43$
$\$43 \div 4 = \mathbf{\$10.75}$
(c) 10 cm + 25 cm + 40 cm + 85 cm = 160 cm
160 cm ÷ 4 = **40 cm**
(d) 0.3 *l* + 4.1 *l* + 7.6 *l* + 7.7 *l* + 9 *l* = 28.7 *l*
28.7 *l* ÷ 5 = **5.74 *l***
2. $\$8 + \$13 + \$9 = \$30$
$\$30 \div 3 = \mathbf{\$10}$
3. (a) $12 + 10 + 3 + 7 = \mathbf{32}$
(b) $32 \div 4 = \mathbf{8}$
4. $243 \div 3 = \mathbf{81}$
5. 73.5 kg ÷ 2 = **36.75 kg**
6. $16 \div 5 = \mathbf{3.2}$
7. $27.8 \times 3 = \mathbf{83.4}$
8. 9.5 cm × 4 = **38 cm**
9. 255 m*l* × 8 = 2040 m*l*
= **2 *l* 40 m*l***
10. $7 \times 6 = \mathbf{42}$

Exercise 2

1. 5 kg 60 g = 5060 g
5060 g ÷ 4 = **1265 g**
2. Sum = \$41 + \$26 + \$38 + \$31 + \$29
= \$165
Average = \$165 ÷ 5
= **\$33**
3. 2 kg 70 g = 2070 g
2070 g ÷ 6 = **345 g**
4. $\frac{3}{8}$ kg ÷ 3 = $\frac{3}{8}$ kg × $\frac{1}{3}$ = $\frac{1}{8}$ kg
5. $2.76 \times 9 = \mathbf{24.84}$
6. Total → 51 kg × 2 = 102 kg
102 kg – 53.5 kg = **48.5 kg**
7. Total → 15 × 2 = 30
30 – 4 = 26
Smaller number → 26 ÷ 2
= **13**
Larger number → 13 + 4
= **17**

8. Total → 37.5 kg × 2
= 75 kg
3 units → 75 kg
1 unit → 75 kg ÷ 3
= 25 kg
2 units → 25 kg × 2
= **50 kg**
9. Total → 12 × 2 = 24
24 – 6 = 18
Sister's age → 18 ÷ 2
= **9 years**
Tammy's age → 9 + 6
= **15 years**
10. Total → 3.4 × 5 = 17
Total number of pupils absent on Monday and Friday
→ 17 – (2 × 3)
= 11
11 + 3 = 14
14 ÷ 2 = **7**

Level 2

Exercise 1

1. Total → 625 m*l* × 2
= 1250 m*l*
5 units → 1250 m*l*
First water bottle
→ 1 unit
→ 1250 *l* ÷ 5
= **250 m*l***
Second water bottle
→ 4 units
→ 4 x 250 m*l*
= 1000 m*l*
= **1 *l***
2. Total → $34 × 2
= $68
4 units → $68
Ahmad's savings
→ 1 unit
→ $68 ÷ 4
= **$17**
Azman's savings
→ 3 units
→ 3 × $17
= **$51**
3. Total → 24 × 3
= 72
8 units → 72
C → 1 unit
→ 72 ÷ 8
= **9**
A → 2 units
→ 2 × 9
= **18**
B → 5 units
→ 5 × 9
= **45**
4. Total → 162 cm × 3
= 486 cm
Height of Khairul
→ 486 cm – 150 cm – 163 cm
= **173 cm**
5. Total mass of the 3 boxes
→ 810 g × 3
= 2430 g
2 kg 70 g = 2070 g
Mass of box B
→ 2430 g – 2070
= **360 g**
6. Total → 100 × 4
= 400
4th number → 400 – 350
= **50**
7. Total → $28 × 3
= $84
Cost of dress
→ $84 – $19 – $14
= **$51**
8. Sum of the three numbers
→ 16 × 3
= 48
Sum of two of the three numbers
→ 15 × 2
= 30
Third number = 48 – 30
= **18**
9. Total number of sit-ups done by the 4 boys
→ 38 × 4
= 152
Total number of sit-ups done by Brendon, Shah and Gopal
→ 37 × 3
= 111

Number of sit-ups done by Ken
→ 152 – 111
= **41**

10. Total → 4.2 × 10
= 42
Number of goals scored in the 10th game
→ 42 – 35
= **7**

Exercise 2

1. **(3)**
Sum = 8 + 24 + 15 + 19 + 32 + 10
= 108
Average = 108 ÷ 6
= 18

2. **(4)**
5 × 95 = 475

3. **(1)**
Sum = 2 × 30
= 60
60 – 10 = 50

4. **(2)**
Total → $11 × 2
= $22
Jamie → ($22 – $4) ÷ 2
= $9

5. **(3)**
Total = 28 × 2
= 56
→7 units
1 unit → 56 ÷ 7
= 8
Difference → 3 units
→ 3 × 8
= 24

6. **(1)**
Total → 13 × 6
= 78
June → 78 – 58
= 20

7. **(3)**
Total → 105 cm × 5
= 525 cm
Fifth stick
→ 525 cm – 90 cm – 98 cm – 111 cm – 119 cm
= 107 cm

8. **(3)**
Total → 42 kg × 2
= 84 kg
→ 4 units
1 unit → 84 kg ÷ 4
= 21 kg
Heavier boy
→ 3 units
→ 3 × 21 kg
= 63 kg

9. **(4)**
Total number of pupils present from Monday to Friday
→ 37.8 × 5
=189
Total number of pupils present from Monday to Thursday
→ 37.5 × 4
=150
Number of pupils present on Friday
→ 189 – 150
= 39

10. **(4)**
80 cm × 20 = 1600 cm
= 16 m

Exercise 1

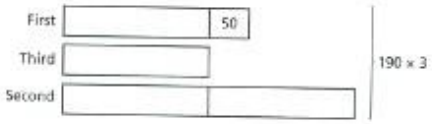
1. Total amount of money of the 4 boys
→ $5.50 × 4
= $22
Total amount of money of Aaron and Jack
→ $22 – $12
= $10
Average amount of money of Aaron and Jack
→ $10 ÷ 2
= **$5**

2. Total → $60 × 3
= $180
Cost of necklace
→ $180 – $49 – $49
= **$82**

3. Total marks scored by the 4 boys
→ 67.5 × 4
= 270
Total marks scored by Jim and Michael
→ 270 – 70 – 80
= 120

Marks scored by Michael
→ 120 ÷ 2
= **60**

4.

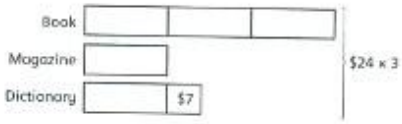


Total → 190 × 3
= 570
4 units → 570 – 50
= 520
1 unit → 520 ÷ 4
= 130
Second cabin
→ 2 units
→ 2 × 130
= **260**

5. (a) Sum = 45 + 70 + 65 + 70 + 85
= 335
Average = 335 ÷ 5
= **67**

(b) Sum for 7 days
= 90 × 7
= 630
Number of buns that must be sold during the weekend
→ 630 – 335
= **295**

6.



Total → $24 × 3
= $72
5 units → $72 – $7
= $65
1 unit → $65 ÷ 5
= $13
Book → 3 units
→ 3 × $13
= $39
Dictionary → $13 + $7
= $20
Difference → $39 – $20
= **$19**

7. (a) Total height of Mr Oman and his wife
→ 167 cm × 2
= 334 cm
Total height of his 2 sons
→ 652 cm – 334 cm
= 318 cm
Average height of his 2 sons
→ 318 cm ÷ 2
= **159 cm**

(b) 318 cm + 12 cm = 330 cm
Elder son → 330 cm ÷ 2
= **165 cm**

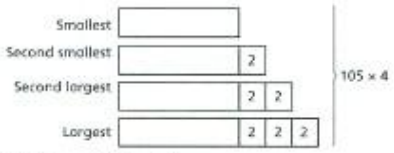
*8. (a) Number of chin-ups done by the whole class
→ 36 × 6
= 216
Number of chin-ups done by the girls
→ 4.8 × 20
= 96
Number of chin-ups done by the boys
→ 216 – 96
= **120**

(b) Number of boys
→ 36 – 20
= 16
Average number of chin-ups done by the boys
→ 120 ÷ 16
= **7.5**

9.

Total → 39 × 3
= 117
3 units → 117 – 3
= 114
1 unit → 114 ÷ 3
= 38
Largest number
→ 38 + 2
= **40**

10.



Total → 105 × 4
= 420
4 units → 420 – (2 + 4 + 6)
= 408
Smallest number → 408 ÷ 4
= **102**

Exercise 2

1. Sum of 7 numbers
= 100 × 7
= 700
Sum of remaining 6 numbers
= 101 × 6
= 606
Number that is removed
→ 700 – 606
= **94**

2. (a) Sum of 5 numbers
= 32 × 5
= 160
Sum of remaining 3 numbers
= 30 × 3
= 90
Sum of the two numbers that are removed
= 160 – 90
= 70
Average of the two numbers that are removed
= 70 ÷ 2
= **35**

(b) 70 – 4 = 66
Smaller number
→ 66 ÷ 2
= **33**
Larger number
→ 33 + 4
= **37**

3. Total mass of first 2 boys
→ 50 kg × 2
= 100 kg
Total mass of 3 boys
→ 60 kg × 3
= 180 kg
Mass of the third boy
→ 180 kg – 100 kg
= **80 kg**

4. Total mass of first 3 girls
→ 34 kg × 3
= 102 kg
Total mass of 4 girls
→ 32 kg × 4
= 128 kg
Mass of the fourth girl
→ 128 kg – 102 kg
= **26 kg**

*5. Total marks scored by 29 pupils
→ 29 × 79
= 2291
Total marks scored by 30 pupils
→ 2291 + 90
= 2381
Average marks scored by 30 pupils
→ 2381 ÷ 30
≈ **79.37**

*6. Total distance jumped by 31 pupils
→ 31 × 134 cm
= 4154 cm
Total distance jumped by 4 pupils
→ 4 × 125.25 cm
= 501 cm
Total distance jumped by 35 pupils
→ 4154 cm + 501 cm
= 4655 cm
Average distance jumped by 35 pupils
→ 4655 cm ÷ 35
= **133 cm**

7. (a) Sum = 71 + 64 + 70 + 80 + 75
= 360
Average = 360 ÷ 5
= **72**

(b) **Ganesh** scored nearest to the average score.

8. (a) Sum = 236 + 251 + 224 + 237 + 255 + 231
= 1434
Average = 1434 ÷ 6
= **239**

(b) **Dabbie** scored furthest from the average score.

9. (a) Sum of the 2 new numbers
= 2 × 10
= 20
Number that remains unchanged
= 20 – 8
= **12**

(b) Sum of the 2 original numbers
= 2 × 9
= 18
Original number that has been changed to 8
= 18 – 12
= **6**

10. (a) Sum of the 2 new numbers
= 2 × 22.5
= 45
Number that remains unchanged
= 45 – 21
= **24**

(b) Sum of the 2 original numbers
= 2 × 25
= 50
Original number that has been changed to 21
= 50 – 24
= **26**

Chapter 9 Percentage

Level 1

Exercise 1

1. 44
2. 76
3. (a) 7 (b) 81 (c) 20 (d) 80
4. (a) 9 (b) 75 (c) 100 (d) 100
5. (a) 38 (b) 60 (c) 100 (d) 50
6. (a) 9 (b) 66 (c) 60 (d) 90
7. (a) $\frac{17}{100}$ (b) $\frac{55}{100} = \frac{11}{20}$ (c) $\frac{4}{100} = \frac{1}{25}$ (d) $\frac{96}{100} = \frac{24}{25}$
8. (a) 0.19 (b) 0.35 (c) 0.49 (d) 0.8
9. (a) 85 (b) 15
10. (a) 6 (b) 94
11. (a) 30 (b) 70
12. (a) $\frac{19}{20} = \frac{95}{100}$ = **95%**

(b) $\frac{3}{5} = \frac{60}{100}$ = **60%**

(c) $\frac{60}{125} = \frac{12}{25}$
$= \frac{48}{100}$
= **48%**

(d) $\frac{180}{240} = \frac{45}{60}$
$= \frac{15}{20}$
$= \frac{75}{100}$
= **75%**

13. $\frac{3}{20} \times 100\% = \frac{300}{20}\%$
= **15%**

14. (a) $\frac{9}{25} \times 100\% = \frac{900}{25}\%$
= **36%**

(b) 100% – 36% = **64%**

15. $\frac{7}{20} \times 100\%$ = **35%**

Exercise 2

1. (a) $\frac{18}{60} \times 100\%$ = **30%**
(b) 100% – 30% = **70%**
2. 200 – 84 = 116
$\frac{116}{200} \times 100\%$ = **58%**
3. 80 – 16 = 64
$\frac{64}{80} \times 100\%$ = **80%**
4. (a) $\frac{25}{100} \times \$300$ = **\$75**
(b) $\frac{9}{100} \times 500$ cm= **45** cm
(c) $\frac{80}{100} \times 20$ kg = **16** kg
(d) $\frac{100}{100} \times 70$ m= **70** m
5. $\frac{20}{100} \times \$600$ = **\$120**
6. $\frac{35}{100} \times 40$ = **14**
7. 100% – 65% = 35%
$\frac{35}{100} \times \$500$ = **\$175**

8. 100% – 80% = 20%

$\frac{20}{100} \times 45 = \mathbf{9}$

9. 100% – 95% = 5%

$\frac{5}{100} \times 40 = \mathbf{2}$

10. $\frac{66}{100} \times 150 = \mathbf{99}$

11. (a) $\frac{20}{100} \times 30 = \mathbf{6}$

(b) 100% – 20% – 50% = **30%**

(c) $\frac{30}{100} \times 30 = \mathbf{9}$

12. (a) $\frac{24}{100} \times \$200 = \mathbf{\$48}$

(b) 100% – 15% – 24% = **61%**

(c) $\frac{61}{100} \times \$200 = \mathbf{\$122}$

13. 100% – 60% – 10% = 30%

$\frac{30}{100} \times 50 = \mathbf{15}$

14. 100% – 40% – 10% – 15% = 35%

$\frac{35}{100} \times 120 = \mathbf{42}$

15. 100% – 16% – 18% – 64% = 2%

$\frac{2}{100} \times 1700 = \mathbf{34}$

Level 2

Exercise 1

1. 2 m = 200 cm

$\frac{10}{200} \times 100\% = \mathbf{5\%}$

2. 2 kg = 2000 g

$\frac{1500}{2000} \times 100\% = \mathbf{75\%}$

3. 1 *l* = 1000 m*l*

$\frac{1900}{1000} \times 100\% = \mathbf{190\%}$

4. 3 km 200 m = 3200 m

2 km = 2000 m

$\frac{3200}{2000} \times 100\% = \mathbf{160\%}$

5. $\frac{7}{100} \times \$900 = \mathbf{\$63}$

6. $\frac{3}{100} \times \$4000 = \mathbf{\$120}$

7. $\frac{20}{100} \times \$110 = \mathbf{\$22}$

8. $\frac{6}{100} \times \$50\,000 = \mathbf{\$3000}$

9. $\frac{12}{100} \times \$2000 = \mathbf{\$240}$

10. (a) $\frac{40}{100} \times \$60 = \mathbf{\$24}$

(b) \$60 – \$24 = **\$36**

11. (a) $\frac{7}{100} \times \$130 = \mathbf{\$9.10}$

(b) \$130 + \$9.10 = **\$139.10**

12. (a) $\frac{1}{100} \times \$15\,000 = \mathbf{\$150}$

(b) \$15 000 + \$150 = **\$15 150**

13. 100% – 40% = 60%

$\frac{60}{100} \times \$15 = \mathbf{\$9}$

14. $\frac{7}{100} \times \$460 = \$32.20$

\$460 + \$32.20 = **\$492.20**

15. $\frac{2}{100} \times \$6500 = \$130$

\$6500 + \$130 = **\$6630**

Exercise 2

1. **(3)**

6 m = 600 cm

$\frac{150}{600} \times 100\% = 25\%$

2. **(2)**

$\frac{80}{100} = 0.8$

3. **(4)**

$\frac{11}{20} \times 100\% = 55\%$

4. **(1)**

100% – 25% = 75%

$\frac{75}{100} \times \$8 = \$6$

5. **(4)**

$\frac{7}{100} \times \$400 = \$28$

\$400 + \$28 = \$428

6. **(3)**

$\frac{96}{150} \times 100\% = 64\%$

7. **(2)**

100% – 60% = 40%

$\frac{40}{100} \times 40 = 16$

8. **(4)**

\$50 – \$10 = \$40

$\frac{40}{50} \times 100\% = 80\%$

9. **(1)**

$1 - \frac{1}{4} = \frac{3}{4}$

$\frac{3}{4} \times 100\% = 75\%$

10. **(2)**

$\frac{5}{100} \times \$50\,000 = \$2500$

11. **(3)**
Adults → 75% + 10%
= 85%
Children → 100% – 85%
= 15%
Difference → 85% – 15%
= 70%

12. **(3)**
Oranges → $\frac{10}{100} \times 50$
= 5
Apples → 50 – 5
= 45
Difference → 45 – 5
= 40

13. **(4)**
100% – 15% – 30% = 55%
$\frac{55}{100} \times 40 = 22$

14. **(2)**
10% – 7% = 3%
$\frac{3}{100} \times \$2000 = \$60$

15. **(1)**
Cats → $\frac{3}{4}$ = 75%
Rabbits and dogs → 100% – 75%
= 25%
Rabbits and dogs → 25% × 40
= $\frac{25}{100} \times 40$
= 10

Level 3

Exercise 1

1. $\frac{2}{8} \times 100\% = \mathbf{25\%}$
2. $\frac{11}{20} \times 100\% = \mathbf{55\%}$
3. $\frac{6}{10} \times 100\% = \mathbf{60\%}$
4. \$8 + \$32 = \$40
$\frac{8}{40} \times 100\% = \mathbf{20\%}$
5. \$20 + \$24 + \$36 = \$80
$\frac{36}{80} \times 100\% = \mathbf{45\%}$
6. \$900 + \$250 + \$350 = \$1500
$\frac{900}{1500} \times 100\% = \mathbf{60\%}$
7. 100% – 10% = 90%
90 : 10 = **9 : 1**
8. 100% – 36% = 64%
36 : 64 = **9 : 16**
9. 100% – 10% – 30% = 60%
10 : 60 = **1 : 6**
10. 100% – 20% – 15% = 65%
15 : 65 = **3 : 13**
11. 100% – 18% – 25% = 57%
25 : 57
12. Red → 30% ÷ 3
= 10 %
Yellow → 100% – 30% – 10%
= 60%
30 : 10 : 60 = **3 : 1 : 6**
13. Car → 24% × 2
= 48%
Walk → 100% – 24% – 48%
= 28%
24 : 48 : 28 = **6 : 12 : 7**
14. Children : adults = 1 : 1
Boys → 4 units
Girls → 3 units
Children → 4 units + 3 units
= 7 units
Adults → 7 units
Boys : Girls : Adults = **4 : 3 : 7**
15. Red → 4 units
Blue → 5 units
Red + Blue → 9 units
Black → 70%
Red + Blue → 30%
→ 9 units
10% → 3 units
70% → 3 × 7 units
= 21 units
Black : Red : Blue = **21 : 4 : 5**

Exercise 2

1. 13 + 7 = 20
$\frac{13}{20} \times 100\% = \mathbf{65\%}$
2. 12 + 13 = 25
$\frac{13}{25} \times 100\% = \mathbf{52\%}$
3. 13 + 6 + 1 = 20
$\frac{6}{20} \times 100\% = \mathbf{30\%}$
4. 5 + 4 + 11 = 20
$\frac{4}{20} \times 100\% = \mathbf{20\%}$

*5. Hockey → $\frac{1}{5}$
= 20%
Basketballs + volleyballs → 80%
→ 5 units + 3 units
= 8 units
1 unit → 80% ÷ 8
= 10%
Basketballs → 5 units
= 5 × 10%
= **50%**

*6. Children → $\frac{3}{10}$
= 30%
Adults → 70%
→ 9 units + 5 units
→ 14 units
1 unit → 70% ÷ 14
= 5%
5 units → 5 × 5%
= **25%**

7. Boys : Girls = 1 : 2
= 3 : 6
Children : Adults = 9 : 1
Boys : Girls : Adults = 3 : 6 : 1
Total = 3 + 6 + 1
= 10
Percentage of people who are girls
= $\frac{6}{10}$ × 100 %
= **60%**

8. 20% of B → $\frac{1}{5}$ of B = $\frac{1}{3}$ of A
A : B = **3 : 5**

9. Gary's salary → 60%
= $\frac{3}{5}$
Ben's salary → 25%
= $\frac{1}{4}$
= $\frac{3}{12}$
Gary's salary : Ben's salary = **5 : 12**

10. Lions → 40%
= $\frac{4}{10}$
Tigers → $\frac{4}{7}$
Lions : Tigers = **10 : 7**

11. P → 30%
= $\frac{3}{10}$
Q → 10%
= $\frac{1}{10}$
= $\frac{3}{30}$
P : Q = 10 : 30
= 1 : 3
P : (P + Q) = **1 : 4**

12. C → 50% = $\frac{1}{2}$
D → $\frac{1}{5}$
C : D = 2 : 5
C : (D – C) = **2 : 3**

13. Lucy → 80%
= $\frac{4}{5}$
= $\frac{12}{15}$
Natalie → 75%
= $\frac{3}{4}$
= $\frac{12}{16}$
Lucy : Natalie = 15 : 16
Lucy : (Natalie – Lucy) = **15 : 1**

14. Chocolate → 45%
= $\frac{9}{20}$
Hazelnut → 30%
= $\frac{3}{10}$
= $\frac{9}{30}$
Chocolate : Hazelnut = 20 : 30
= 2 : 3
Total number of units = 2 + 3
= 5
Fraction of the cookies that are chocolate cookies = $\frac{2}{5}$

15. Male → 50%
= $\frac{1}{2}$
= $\frac{2}{4}$
Female → $\frac{2}{5}$
Female : Male = 5 : 4
Total number of units = 5 + 4
= 9
Fraction of the workers that is male = $\frac{4}{9}$

Chapter 10 Angles

Level 1

Exercise 1

1. $180° - 85° = \mathbf{95°}$
2. $180° - 90° = \mathbf{90°}$
3. $180° - 51° - 30° = \mathbf{99°}$
4. $360° - 140° = \mathbf{220°}$
5. $360° - 120° - 95° = \mathbf{145°}$
6. $360° - 80° - 90° - 138° = \mathbf{52°}$
7. $155°$
8. $140°$
9. $39° + 65° = \mathbf{104°}$
10. $152° - 31° = \mathbf{121°}$

Exercise 2

1. $180° - 90° - 12° = \mathbf{78°}$
2. $80° - 59° = \mathbf{21°}$
3. $360° - 90° - 113° - 20° = \mathbf{137°}$
4. $90° + 73° = \mathbf{163°}$
5. $360° - 64° - 160° - 121° = \mathbf{15°}$
6. $180° - 38° - 90° - 7° = \mathbf{45°}$
7. $360° - 57° - 58° - 60° = \mathbf{185°}$
8. $36° + 51° + 25° = \mathbf{112°}$
9. $360° - 90° - 159° - 90° = \mathbf{21°}$
10. $162° - 29° - 90° = \mathbf{43°}$

Level 2

Exercise 1

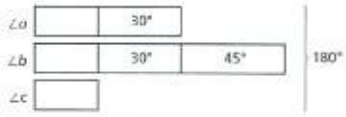
1. $\angle DOE$ (vertically opposite angles)
2. $180°$ (angles on a straight line)
3. $\angle AOC$, $\angle AOD$, $\angle BOC$, $\angle BOD$ (any 2)
4. $100° - 54° = \mathbf{46°}$
5. $180° - 100° = \mathbf{80°}$
6. $32° + 102° = \mathbf{134°}$
7. $\angle QOT$ (vertically opposite angles)
8. $134° - 90° = \mathbf{44°}$
9. $180° - 128° = \mathbf{52°}$
10. $52° \div 2 = \mathbf{26°}$

Exercise 2

1. **(2)**
   $158° - 67° = 91°$
2. **(3)**
   $180° - 91° = 89°$
3. **(4)**
   $360° - 95° - 21° = 244°$
4. **(4)**
   $360° - 138° = 222°$
5. **(4)**
   $(222° \div 3) \times 2 = 148°$
6. **(2)**
   $180° - 60° = 120°$
   $\angle MON = 120° \div 4$
   $= 30°$
7. **(1)**
   $\angle JON = 30° \times 3 = 90°$
   $60° : 90° : 30° = 2 : 3 : 1$
8. **(2)**
   $\angle DOE$, $\angle BOC$ and $\angle COD$ lie on the same straight line.
9. **(4)**
   $\angle ROW$ is also a right angle.
10. **(1)**
    $90° - 76° = 14°$

Level 3

Exercise 1

1. $180° - 90° - 71° = \mathbf{19°}$
2. $\mathbf{71°}$ (vertically opposite angles)
3. $90° + 19° = \mathbf{109°}$
4. $360° - 90° = \mathbf{270°}$
5. $(5 + 3 + 1)$ units $\rightarrow 270°$
   9 units $\rightarrow 270°$
   $\angle z \rightarrow 1$ unit
   $\rightarrow 270° \div 9$
   $= \mathbf{30°}$
6. $270° - 30° = \mathbf{240°}$
7. 

   3 units $\rightarrow 180° - 45° - 30° - 30°$
   $= 75°$
   $\angle c \rightarrow 1$ unit
   $\rightarrow 75° \div 3$
   $= \mathbf{25°}$
8. $\angle b = 25° + 30° + 45° = \mathbf{100°}$
9. $\angle a = 25° + 30° = \mathbf{55°}$
   $55 : 100 : 25 = \mathbf{11 : 20 : 5}$
10. $\frac{55}{180} = \frac{11}{36}$

Exercise 2

1. $180° - 150° = \mathbf{30°}$
2. 3 units → 30°
   1 unit → $30° \div 3$
   $= 10°$
   ∠WOX → 10 units
   → $10 \times 10°$
   $= \mathbf{100°}$
3. $180° - 100° = \mathbf{80°}$
4. $100 : 150 = \mathbf{2 : 3}$
5. $\frac{80}{360} = \frac{2}{9}$
6. $180° - 36° = \mathbf{144°}$
7. $\angle ROU = 144° \div 2$
   $= 72°$
   $\angle POT = \frac{1}{4} \times 72°$
   $= \mathbf{18°}$
8. $18 : 144 = \mathbf{1 : 8}$
9. (a) $\frac{18}{180} = \frac{1}{10}$
   $\frac{1}{10} \times 100\% = \mathbf{10\%}$
   (b) $\frac{144}{360} = \frac{2}{5}$
10. $18 : 72 : 36 = \mathbf{1 : 4 : 2}$

Chapter 11 Properties of Triangles and 4-sided Figures

Level 1

Exercise 1

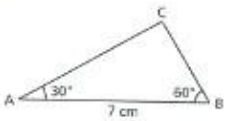
1. $180° - 55° - 40° = \mathbf{85°}$
2. $180° - 90° - 70° = \mathbf{20°}$
3. $180° - 69° - 10° = \mathbf{101°}$
4. $180° - 36° = 144°$
   $144° \div 2 = \mathbf{72°}$
5. $180° \div 3 = 60°$
   $60° \times 2 = \mathbf{120°}$
6. $180° - 35° - 35° = \mathbf{110°}$
7. $\angle LKM = 180° - 90° - 51° = 39°$
   $\angle KLM = 180° - 90° - 39° = \mathbf{51°}$
8. $180° \div 3 = 60°$
   $180° - 60° - 40° = \mathbf{80°}$
9. $180° - 150° = 30°$
   $30° \div 2 = \mathbf{15°}$
10. $45° - 36° = \mathbf{9°}$

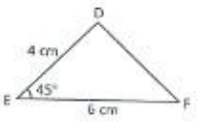
Exercise 2

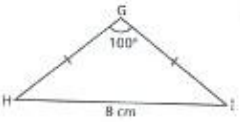
1. $180° - 130° = \mathbf{50°}$
2. $180° - 52° = \mathbf{128°}$
3. $180° - 58° = \mathbf{122°}$
4. $180° - 60° = \mathbf{120°}$
5. $180° - 105° = 75°$
   $75° - 40° = \mathbf{35°}$
6. $180° - 112° = 68°$
   $68° \div 2 = \mathbf{34°}$
7. $90° - 29° = \mathbf{61°}$
8. $180° - 90° - 46° = \mathbf{44°}$
9. $180° - 75° = 105°$
   $105° - 49° - 38° = \mathbf{18°}$
10. $180° - 70° - 74° = \mathbf{36°}$

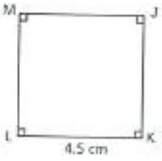
Level 2

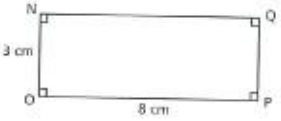
Exercise 1

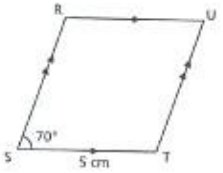
1. 

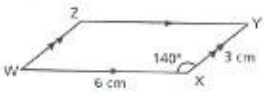
2. 

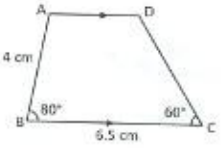
3. 

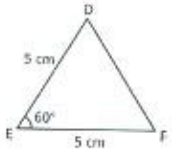
4. 

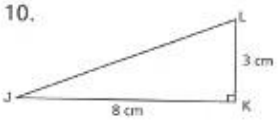
5. 

6. 

7. 

8. 

9. 

10. 

Exercise 2

1. **(3)**
   Sum of interior angles = 180°
2. **(3)**
   An isosceles triangle has 2 equal angles.
   W: 180° – 94° – 43° = 43° (✓)
   X: 180° – 115° – 35° = 30° (✗)
   Y: 180° – 40° – 70° = 70° (✓)
   Z: Z is an isosceles triangle since 2 of its sides are equal. (✓)
3. **(2)**
   180° – 88° = 92°
   92° ÷ 2 = 46°
4. **(2)**
   180° – 28° – 50° = 102°
   102° – 76° = 26°
5. **(2)**
   115° – 40° – 38° = 37°
6. **(3)**
   180° – 35° = 145°
   145° – 26° = 119°
7. **(2)**
   180° – 37° – 37° = 106°
8. **(4)**
   180° – 94° = 86°
   86° ÷ 2 = 43°
9. **(2)**
   180° – 110° = 70°
   70° – 43° = 27°
10. **(4)**
    180° – 130° = 50°
    83° – 50° = 33°
    180° – 90° – 33° = 57°

Exercise 1

*1. ∠BAC = 94° ÷ 2
= 47°
∠ABC = 180° – 94° – 47°
= **39°**

*2. 5 units → 90°
∠XZY → 1 unit
→ 90° ÷ 5
= 18°
∠XYZ → 4 units
→ 4 × 18°
= **72°**

*3. ∠DGH = ∠DHG = ∠GDH = 60°
∠DGF = 180° – 60°
= 120°
∠EDG = 180° – 120°
= 60°
∠FDG = 60° ÷ 2
= 30°
∠FDH = ∠GDH + ∠FDG
= 60° + 30°
= **90°**

4. 9 units → 180°
∠PQR → 1 unit
→ 180 ÷ 9
= 20°
∠RPQ → 6 units
→ 6 × 20°
= **120°**

5. ∠SVU + ∠TSV → 10 units
→ 180°
1 unit → 180° ÷ 10
= 18°
∠STU → 3 units
→ 3 × 18°
= **54°**

*6. ∠YXZ → 6 units
→ 24°
1 unit → 24° ÷ 6
= 4°
∠XZY → 5 units
→ 5 × 4°
= 20°
∠XYZ → 180° – 20° – 24°
= **136°**

7. ∠QPR = 180° – 70° – 70°
= 40°
∠PTQ = 180° – 40° – 40°
= **100°**

8. ∠XWY = 180° – 42° – 42°
= 96°
∠VWY = 180° – 42° – 96°
= 42°
∠WVY = 180° – 42° – 42°
= **96°**

*9. ∠DBE = 180° – 90° – 74°
= 16°
180° – 112° = 68°
∠ABE = 68° ÷ 2
= 34°
∠ABD = 34° + 16°
= **50°**

10. ∠KJM = 115°
∠KJN = 115° – 36°
= 79°
∠JNL = 180° – 79° (JKLN is a trapezium)
= **101°**

Exercise 2

*1. 180° – 110° = 70°
∠KLN = 70° ÷ 2
= **35°**

*2. ∠LKN = 110° – 75°
= 35°
∠KNL = 180° – 35° – 35°
= **110°**

*3. ∠KLN → 5 units
→ 35°
1 unit → 35° ÷ 5
= 7°
∠MLN → 8 units
→ 8 × 7°
= 56°
∠LNM = 180° – 110°
= 70°
∠NML = 180° – 70° – 56°
= **54°**

*4. ABF is an isosceles triangle as AB = BF.
∠ABF = 90° + 46°
= 136°
180° – 136° = 44°
∠BFC = 44° ÷ 2
= **22°**

*5. ∠BCF = 180° – 46° – 22° = **112°**

*6. ∠CAD = 90° – 22° = 68°
∠ADE = 180° – 68° = 112°
∠CDE = 112° – 90° = 22°
∠ECD = 180° – 22° – 22° = **136°**

*7. ∠GHI = (180° – 24°) ÷ 2
= 78°
∠EHG = 180° – 65°
= 115°
∠GHI + ∠EHG = 78° + 115°
= **193°**

*8. 78 : 65 = **6 : 5**

*9. 3 units → 78°
1 unit → 78° ÷ 3
= 26°
∠FIH → 2 units
→ 2 × 26°
= **52°**

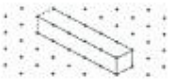
*10. ∠KNM = ∠LMN
= (180° – 20°) ÷ 2
= 80°
∠KMN = 180° – 80° – 80°
= 20°
∠KML = 80° – 20°
= 60°
∠LKM = 180° – 20° – 60°
= 100°
∠KML : ∠LKM = 60 : 100
= **3 : 5**

Chapter 12 Volume of Cubes and Cuboids

Level 1

Exercise 1

1. (a) 6 (b) 6
(c) 9 (d) 11

2. (a)  (b) 
(c)  (d) 

3. (a) 8 (b) 24
(c) 10 (d) 19

4. (a) 9 (b) 15

5.

Solid	Length	Breadth	Height	Volume
A	3 cm	2 cm	3 cm	18 cm³
B	5 cm	3 cm	2 cm	30 cm³
C	5 cm	6 cm	1 cm	30 cm³
D	2 cm	2 cm	8 cm	32 cm³

6. (a) 8 × 3 × 4 = **96** (b) 11 × 5 × 9 = **495**
(c) 3 × 2 × 20 = **120** (d) 10 × 9 × 1 = **90**

7. (a) 5 × 5 × 5 = **125** (b) 9 × 9 × 9 = **729**

8. 40 cm × 40 cm × 40 cm = **64 000 cm³**

9. 28 cm × 20 cm × 10 cm = **5600 cm³**

10. 12 cm³ × 3 = 36 cm³
12 cm³ + 36 cm³ = **48 cm³**

Exercise 2

1. (a) 160 (b) 3000
   (c) 4010 (d) 18 005
2. (a) **0 l 250 ml** (b) **1 l 705 ml**
   (c) **3 l 10 ml** (d) **15 l 9 ml**
3. 50 cm × 20 cm × 9 cm = **9000 cm³**

*4. 19 cm × 14 cm × 15.5 cm = 4123 cm³
= **4 l 123 ml**

5. 10 cm × 3 cm × 2.5 cm = **75 cm³**
6. 30 cm × 30 cm × 18 cm = 16 200 cm³
= **16 l 200 ml**
7. 8 cm × 6 cm × 4.5 cm = 216 cm³
216 cm³ × 5 = 1080 cm³
= **1 l 80 ml**
8. 7 cm × 7 cm × 7 cm = 343 cm³
343 cm³ × 10 = 3430 cm³
= **3 l 430 ml**
9. 34 cm × 10 cm × 8 cm = 2720 cm³
2720 cm³ × 4 = 10 880 cm³
= **10 l 880 ml**
10. 20 cm × 20 cm × 15 cm = 6000 cm³
= **6 l**

Level 2

Exercise 1

1. 16 − 12 = **4**
2. 13 − 8 = **5**
3. 9 − 3 = **6**
4. 17 − 7 = **10**

*5. 52 cm × 45 cm × 33 cm = 77 220 cm³
= 77.22 l
77.22 l − 10.07 l = 67.15 l
= **67 l 150 ml**

*6. 25 cm × 25 cm × 20 cm = 12 500 cm³
= 12.5 l
12.5 l − 6.05 l = 6.45 l
= **6 l 450 ml**

*7. 95 cm × 60 cm × 75 cm = 427 500 cm³
427 500 cm³ × $\frac{3}{4}$ = 320 625 cm³
= **320 l 625 ml**

*8. 36 cm × 36 cm × 36 cm = 46 656 cm³
46 656 cm³ × $\frac{5}{6}$ = 38 880 cm³
= **38 l 880 ml**

*9. (a) 100 cm × 45 cm × 60 cm = 270 000 cm³
= 270 l
270 l × $\frac{3}{10}$ = **81 l**
(b) 270 l − 81 l = **189 l**

*10. 21 cm × 21 cm × 21 cm = 9261 cm³
$1 - \frac{3}{7} = \frac{4}{7}$
9261 cm³ × $\frac{4}{7}$ = 5292 cm³
= **5 l 292 ml**

Exercise 2

1. **(3)**
   l, m³ and cm³ are units used to measure volumes.
   cm² is a unit used to measure areas.
   500 l and 500 m³ are too large to be the capacity of a water bottle.
2. **(4)**
3. **(4)**
   Volume of 1 cube = 1 cm × 1 cm × 1 cm
   = 1 cm³
   Volume of solid = 16 × 1 cm³
   = 16 cm³
4. **(1)**
   20 × 2 = 40
   20 + 40 = 60
5. **(2)**
   5 × 4 × 20 = 400
   400 × $\frac{9}{10}$ = 360
6. **(4)**
   27 × 27 × 9 = 6561
7. **(1)**
   60 cm × 40 cm × 25 cm = 60 000 cm³
   100% − 60% = 40%
   60 000 cm³ × 40% = 60 000 cm³ × $\frac{40}{100}$
   = 24 000 cm³
   = 24 l
8. **(2)**
   11 − 4 = 7
9. **(4)**
   To make a 2-cm cube,
   number of unit cubes needed
   = 2 × 2 × 2
   = 8
   8 − 4 = 4
10. **(2)**
    To make a 3-cm cube,
    number of unit cubes needed
    = 3 × 3 × 3
    = 27
    27 − 21 = 6

Level 3

Exercise 1

1. 4.25 ℓ × 9 = 38.25ℓ
   = **38 ℓ 250 mℓ**
2. 750 mℓ × 8 = 6000 mℓ
   = **6 ℓ**

*3. Capacity of cubical tank
= 10 cm × 10 cm × 10 cm
= 1000 cm³
Volume of water in the tank at first
= $\frac{1}{2}$ × 1000 cm³
= 500 cm³
Volume of water in tank in the end
= $\frac{4}{5}$ × 1000 cm³
= 800 cm³
Amount of water poured into the tank
= 800 cm³ – 500 cm³
= 300 cm³
= **300 mℓ**

*4. Volume of water in rectangular tank
= 18 cm × 13 cm × 15 cm
= 3510 cm³
Volume of water poured into cubical tank
= 8 cm × 8 cm × 8 cm
= 512 cm³
Volume of water left in rectangular tank
= 3510 cm³ – 512 cm³
= **2998 cm³**

*5. Volume of water in the tank at first
= $\frac{5}{8}$ × 16 cm × 16 cm × 16 cm
= 2560 cm³
Volume of water in the tank after 2 minutes
= 2560 cm³ + (1000 × 2) cm³
= 4560 cm³
= **4 ℓ 560 mℓ**

*6. Volume of water in the tank at first
= $\frac{1}{3}$ × 21 cm × 21 cm × 21 cm
= 3087 cm³
Volume of water in the tank after 3 minutes
= 3087 cm³ + (1500 × 3) cm³
= 7587 cm³
= **7 ℓ 587 mℓ**

*7. Volume of water in the tank at first
= $\frac{1}{6}$ × 18 cm × 18 cm × 18 cm
= 972 cm³
Volume of water in the tank when the water is up to $\frac{5}{8}$ of its height
= $\frac{5}{8}$ × 18 cm × 18 cm × 18 cm
= 3645 cm³
Volume of water poured into the tank
= 3645 cm³ – 972 cm³
= 2673 cm³
= **2 ℓ 673 mℓ**

*8. Volume of water in the tank
= $\frac{3}{8}$ × 24 cm × 24 cm × 24 cm
= 5184 cm³
= **5184 mℓ**

9. (a) 90 : 100 = **9 : 10**
   (b) 9 units → 5400 cm³
   1 unit → 5400 cm³ ÷ 9
   = 600 cm³
   10 units → 10 × 600 cm³
   = **6000 cm³**

10. (a) 80 : 20 = 8 : 2
    = **4 : 1**
    (b) 5 units → 5000 cm³
    1 unit → 5000 cm³ ÷ 5
    = **1000 cm³**

Exercise 2

*1. Volume of water in the rectangular tank at first
= $\frac{2}{3}$ × 55 cm × 40 cm × 36 cm
= 52 800 cm³
Volume of water poured into the cubical tank
= 20 cm × 20 cm × 20 cm
= 8000 cm³
Volume of water left in the rectangular tank
= 52 800 cm³ – 8000 cm³
= 44 800 cm³
= **44 ℓ 800 mℓ**

*2. Volume of water in the cubical tank at first
= 30 cm × 30 cm × 30 cm
= 27 000 cm³
Volume of water poured into the rectangular tank
= 15 cm × 10 cm × 10 cm
= 1500 cm³

Volume of water left in the cubical tank
$= 27\,000\ cm^3 - 1500\ cm^3$
$= 25\,500\ cm^3$
Fraction of water left in the cubical tank
$= \frac{25\,500}{27\,000}$
$= \frac{17}{18}$

3. Volume of water in the cubical tank at first
$= 20\ cm \times 20\ cm \times 20\ cm$
$= 8000\ cm^3$
Volume of water discharged after 5 minutes
$= 5 \times 1200\ cm^3$
$= 6000\ cm^3$
Volume of water left
$= 8000\ cm^3 - 6000\ cm^3$
$= 2000\ cm^3$
Fraction of water left in the cubical tank
$= \frac{2000}{8000}$
$= \frac{1}{4}$

*4. Volume of petrol in the tank at first
$= 65\ cm \times 50\ cm \times 32\ cm$
$= 104\,000\ cm^3$
Volume of petrol used
$= 104\,000\ cm^3 - 26\,000\ cm^3$
$= 78\,000\ cm^3$
Ratio of the volume of petrol used to the volume of petrol left
$= 78\,000 : 26\,000$
$= \mathbf{3 : 1}$

5. Volume of water in the cubical tank at first
$= 40\ cm \times 40\ cm \times 40\ cm$
$= 64\,000\ cm^3$
Volume of water pumped out after 4 minutes
$= 4 \times 4000\ cm^3$
$= 16\,000\ cm^3$
Volume of water left
$= 64\,000\ cm^3 - 16\,000\ cm^3$
$= 48\,000\ cm^3$
Percentage of water left in the cubical tank
$= \frac{48\,000}{64\,000}$
$= \frac{3}{4}$
$= \mathbf{75\%}$

*6. Volume of water in the cubical tank
$= 50\ cm \times 50\ cm \times 50\ cm$
$= 125\,000\ cm^3$
Time needed to pump out all the water
$= 125\,000\ cm^3 \div 15\,000\ cm^3$
$= 8\frac{1}{3}\ min$
$= \mathbf{8\ min\ 20\ s}$

7. Volume of water in the rectangular tank
$= \frac{1}{2} \times 60\ cm \times 60\ cm \times 40\ cm$
$= 72\,000\ cm^3$
Volume of water needed to fill the tank to its brim
$= 72\,000\ cm^3$
Time needed to fill the tank completely
$= 72\,000\ cm^3 \div 6000\ cm^3$
$= \mathbf{12\ min}$

8. $9\ cm \div 4\ cm = 2\ R\ 1$
$8\ cm \div 4\ cm = 2$
$19\ cm \div 4\ cm = 4\ R\ 3$
$2 \times 2 \times 4 = \mathbf{16}$

9. $20\ cm \div 3\ cm = 6\ R\ 2$
$6\ cm \div 3\ cm = 2$
$10\ cm \div 3\ cm = 3\ R\ 1$
$6 \times 2 \times 3 = \mathbf{36}$

10. $7\ cm \div 2\ cm = 3\ R\ 1$
$3 \times 3 \times 3 = \mathbf{27}$

Semestral Assessment 2

Specimen 1

PAPER 1 Booklet A

1. **(1)**
$0.05 \times 8000 = 400$

2. **(4)**
The solid is made up of 9 cubes.

3. **(2)**
$(250 + 40) \div 2 = 290 \div 2$
$= 145$

4. **(1)**
$8 \times 4 = 32$

5. **(3)**
$\frac{160}{250} \times 100\% = \frac{16}{25} \times 100\%$
$= 64\ \%$

6. **(4)**
$360° - 32° - 25° = 303°$

7. **(3)**
$160 + 63 \times 9 - 7 = 160 + 567 - 7$
$= 727 - 7$
$= 720$

8. **(2)**
$\frac{11}{12} \times (1 - \frac{2}{3}) = \frac{11}{12} \times \frac{1}{3}$
$= \frac{11}{36}$

9. **(4)**
Option (1) : $1.09 \times 3 = 3.27$
Option (2) : $20 \div 6 = 3.333 \ldots$
Option (3) : $4 - 0.69 = 3.31$
Option (4) : $1.29 + 1.95 = 3.24$

10. **(4)**
Book → \$40 – \$12
= \$28
28 : 40 = 7 : 10

11. **(1)**
(2 units + \$14) ÷ 2 = 1 unit + \$7

5 units → \$86 – \$7 – \$14
= \$65
1 unit → \$65 ÷ 5
= \$13
2 units → 2 × \$13
= \$26

12. **(1)**
$100 \div 4 = 25$
$25 \times 25 = 625$

13. **(2)**
$7.6 \times 3 = 22.8$
$22.8 - 7 = 15.8$

14. **(2)**
Red blocks → 100 % – 25 % – 45 %
= 30 %
30 : 25 = 6 : 5

15. **(4)**
$\angle ABC = \angle ADC$
$= \frac{3}{5} \times 180°$
$= 108°$
$108° + 108° = 216°$

PAPER 1 Booklet B

16. $2\,000\,000 = 2 \times$ **1 000 000**

17. $8 : 14 : 10 = 4 : $ **7** $: 5$

18. 10 units → 60
1 unit → 60 ÷ 10
= 6
Boys → 7 units
→ 7 × 6
= **42**

19. $2\frac{3}{4} \times 2 = \frac{11}{4} \times 2$
$= \frac{11}{2}$
$= 5\frac{1}{2}$

20. $\frac{1}{2} \times (4 + 18) \times 13 =$ **143**

21. $120 + 216 + 75 = 411$
$411 \div 3 =$ **137**

22. Number of toys it can produce in 1 h
$= 450 \div 2$
$= 225$
Number of toys it can produce in 7 h = 7×225
= **1575**

23. $41° - 19° =$ **22°**

24. $100\% - 80\% = 20\%$
$\frac{20}{100} = \frac{1}{5}$

25. $\frac{1}{5} \times 20$ cm $\times 20$ cm $\times 20$ cm $= 1600$ cm^3
= **1 / 600 m/**

26. Box C → 4503 + 1888
= 6391
Box B → 6391 + 709
= **7100**

27. $13 \times 14 = 182$
$(13 - 11) \times (14 - 6) = 16$
$182 - 16 =$ **166**

28. 100% → 1900
1% → 19
99% → 99 × 19
= **1881**

29. 4 units → \$3400
1 unit → \$3400 ÷ 4
= \$850
3 units + 4 units → 7 units
→ 7 × \$850
= **\$5950**

30. $\angle ACO = 60° - 21°$
$= 39°$
$\angle AOC = 180° - 39° - 60°$
$=$ **81°**

13. **(1)**
English : Malay = 9 : 1
= 54 : 6
English : Chinese = 6 : 1
= 54 : 9
English : Chinese : Malay = 54 : 9 : 6
= 18 : 3 : 2

14. **(3)**
$180° - 110° = 70°$
$70° \div 2 = 35°$

15. **(4)**
$4 \times 4 \times 4 = 64$
$2 \times 1 \times 1 = 2$
$\frac{2}{64} = \frac{1}{32}$

PAPER 1 Booklet B

16. Largest 6-digit even number = **999 998**
17. $7 : (2 + 7) = \mathbf{7 : 9}$
18. $(20 - 6 - 6) \div 2 = 4$
$4 \times 6 = \mathbf{24}$
19. $\frac{3}{4}$ kg $\times \frac{5}{6} = \frac{5}{8}$ kg
$\frac{3}{4}$ kg $- \frac{5}{8}$ kg $= \frac{1}{8}$ **kg**
20. $75 - 15 = 60$
$\frac{60}{75} \times 100\ \% = \mathbf{80\%}$
21. 2 km 40 m = **2.04** km
22. 13 05 – 01 20 = 12 65 – 01 20
= **11 45**
23. **360°**
24. $\frac{12}{15} = \frac{4}{5} = \frac{8}{10}$
25. $\frac{3}{5}$ kg $\div 4 = \frac{3}{20}$ kg
= **150 g**
26. $13 - 2 - 5 - 2 = \mathbf{4}$
27. $180° - 144° = 36°$
$180° - 36° - 90° = \mathbf{54°}$
28. $35 \div 5 = 7$
$18 \div 5 = 3$ R 3
$14 \div 5 = 2$ R 4
$7 \times 3 \times 2 = \mathbf{42}$
29. Fraction of women $\rightarrow (1 - \frac{1}{10}) \times \frac{1}{6}$
$= \frac{3}{20}$
Fraction of men $\rightarrow 1 - \frac{1}{10} - \frac{3}{20}$
$= \frac{3}{4}$
$\frac{1}{10}$ of spectators $\rightarrow 50$
$\frac{10}{10}$ of spectators $\rightarrow 500$
$\frac{3}{4}$ of spectators $\rightarrow \frac{3}{4} \times 500$
= **375**
30. $1.5 + 3\frac{4}{5} = 1.5 + 3.8$
$= 5.3$
$5.3 + 3.8 = \mathbf{9.1}$

PAPER 2

1. $1 - \frac{2}{5} - \frac{1}{4} = \frac{7}{20}$
7 units $\rightarrow$ \$280
1 unit $\rightarrow$ \$280 ÷ 7
= \$40
$\frac{2}{5} - \frac{1}{4} = \frac{3}{20}$
3 units $\rightarrow 3 \times$ \$40
= **\$120**
2. 0.8% × \$250 000 = \$2000
\$250 000 + \$2000 = **\$252 000**
3. Shoes $\rightarrow$ 40%
$= \frac{2}{5}$
$= \frac{6}{15}$
Bag $\rightarrow \frac{1}{3}$
$= \frac{5}{15}$
Ratio = **6 : 5**
4. 5.41 – 3.07 = 2.34
3.07 – 2.34 = **0.73**
5. $\angle WOX = 180° - 81°$
$= 99°$
$\angle YOZ = 99° - 72°$
$= 27°$
$\angle WOX : \angle YOZ = 99 : 27$
= **11 : 3**
6. (a) 40 + 28 + 37 = 105
105 ÷ 3 = **35**
(b) 40 – 35 = **5**

7. $186.50 – (4 × $29.30) = $69.30
1 torch → $69.30 ÷ 7
= $9.90
1 torch + 1 calculator
→ $9.90 + $29.30 + $9.90
= **$49.10**

8. (a) $\frac{2}{3} = \frac{6}{9}$
$30\% = \frac{3}{10} = \frac{6}{20}$
X : Y = **9 : 20**
(b) 9 units → 90
1 unit → 90 ÷ 9
= 10
20 units → 20 × 10
= **200**

9. (a) $\frac{7}{10} \times \frac{6}{7} = \frac{3}{5}$
$\frac{3}{10} \times \frac{5}{6} = \frac{1}{4}$
$\frac{3}{5} + \frac{1}{4} = \frac{17}{20}$
(b) $1 - \frac{17}{20} = \frac{3}{20}$
$= \frac{15}{100}$
= **15%**

10. (a)

Class	Number of pupils who passed the fitness test	Number of pupils who did not pass the fitness test	Total number of pupils in the class
5A	35	7	42
5B	35	5	40
5C	36	5	41
5D	34	4	38
5E	36	3	39

(b) Number of pupils who did not pass the first test
→ 7 + 5 + 5 + 4 + 3
= 24
Number of pupils who passed the second test
→ $\frac{5}{12} \times 24$
= 10
Total number of pupils in P5
→ 42 + 40 + 41 + 38 + 39
= 200
Total number of pupils who passed the test
→ 35 + 35 + 36 + 34 + 36 + 10
= 186
$\frac{186}{200}$ = **93%**

11. (a) 180° – 110° = 70°
∠DBE = ∠DEB = 70° ÷ 2
= 35°
∠ABE = 180° – 45° – 35°
= **100°**
(b) ∠AEB = 180° – 100° – 45°
= 35°
∠ACE = 180° – 45° – 35° – 35°
= **65°**

12. (a) 60 cm × 40 cm × 40 cm = 96 000 cm³
$\frac{3}{4} \times 96\,000\ cm^3 = 72\,000\ cm^3$
= **72 *l***
(b) 6 × 8 *l* = **48 *l***
(c) 72 *l* – 48 *l* = 24 *l*
$\frac{24}{96} \times 100\ \%$ = **25%**

13. (a) At first,
Red → 3 units
→ 9 parts
Green → 8 units
→ 24 parts
In the end,
Red → 5 units
→ 10 parts
Green → 12 units
→ 24 parts
1 part → 36
24 parts → 24 × 36
= **864**
(b) 10 parts → 10 × 36
= **360**

14. Fraction of jigsaw puzzle Sharmaine completed in 1 h → 1 ÷ 3
$= \frac{1}{3}$
Fraction of jigsaw puzzle Chloe completed in 1 h → 1 ÷ 6
$= \frac{1}{6}$
Fraction of jigsaw puzzle Sharmaine and Chloe completed together in 1 h → $\frac{1}{3} + \frac{1}{6}$
$= \frac{4}{12} + \frac{2}{12}$
$= \frac{6}{12}$
Time taken for both of them to complete the same jigsaw puzzle together → $1 \div \frac{6}{12}$
$= 1 \times \frac{12}{6}$
= **2 h**

15. (a) Children → 1 unit
→ 5 parts
Adults → 7 units
→ 35 parts
Men → $\frac{3}{5}$ × 35 parts
→ 21 parts
Women → $\frac{2}{5}$ × 35 parts
→ 14 parts
Children + adults → 5 parts + 35 parts
= 40 parts
$\frac{14}{40} = \frac{7}{20}$
= **35%**

(b) 35% × 320 = 112
112 − 7 = 105
40 parts → 320
1 part → 320 ÷ 40
= 8
21 parts → 21 × 8
= 168
Women : Men = 105 : 168
= **5 : 8**

16. (a) 12 − 3 = 9
$\frac{1}{2}$ × 12 × 9 = **54**

(b) Area of Rectangle X
→15 cm × 27 cm
= 405 cm²
Area of Square Y
→12 cm × 12 cm
= 144 cm²
Area of unshaded part of Rectangle X
→ 405 cm² − 54 cm²
= 351 cm²
Area of unshaded part of Square Y
→ 144 cm² − 54 cm²
= 90 cm²
351 : 90 = **39 : 10**

17. (a)

Sentence number	Addition sentence	Answer	Answer as a product of two consecutive numbers
1	2 + 4	6	2 × 2
2	2 + 4 + 6	12	3 × 4
3	2 + 4 + 6 + 8	20	4 × 5
4	**2 + 4 + 6 + 8 + 10**	30	5 × 6
5	2 + 4 + 6 + 8 + 10 + 12	**42**	6 × 7

(b) 110 = 10 × 11
10 − 1 = **9**

(c) 48 × 49 = **2352**