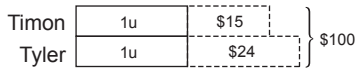
Practice Paper 1

1.



2u = 100 – 15 – 24 = $61

1u = 61 ÷ 2 = $30.50

Amount of money Tyler received from his father

= $30.50 + $24 = $54.50

Tyler received **$54.50** from his father.

2. (a) False

As the water stopped decreasing at 180 seconds (3rd minute), the stopper was placed at the 3rd minute.

(b) True

Total amount of water drained = 3450 m^3 – 450 m^3

= 3000 m^3

3. Target earnings on products = 827.40 – 500 = $327.40

For every 12 products = 0.80 × 12 + 3.40 = $13

No. of sets (whole number only)

= 327.40 ÷ 13 = 25 sets

Amount of money earned from the 25 sets

= 25 × 13 = $325

Remaining amount = 327.40 – 325 = $2.40

No. of individual products = 2.40 ÷ 0.80 = 3

Total no. of products = 25 × 12 + 3 = 303

Jane must sell **303 products**.

4. Fraction of money spent = $\frac{5}{9} + \frac{1}{3} = \frac{8}{9}$

$\frac{1}{9}$ of savings = 1380 + 680 = 2060

$\frac{9}{9}$ of savings = 9 × 2060 = $18 540

6u = $18 540

1u = $3090

13u = $40 170

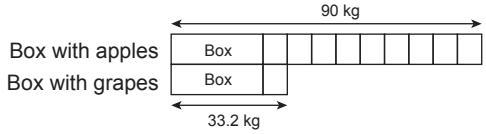
Both of them had a total savings of **$40 170** at first.

5. $\frac{3}{16} \div \frac{1}{32} = 6$

Number of trees including the one at the start = 6 + 1 = 7

There were **7 trees** in total.

6.



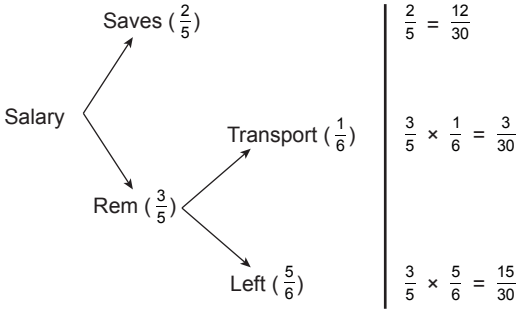
8u = 90 – 33.2 = 56.8

1u = 56.8 ÷ 8 = 7.1

33.2 – 7.1 = 26.1

The mass of the empty box is **26.1 kg**.

7.



(a) Amount of salary left to share = $\frac{15}{30}$

$\frac{15}{30} \div \frac{1}{6}$ = 3 person (including Calissa)

Calissa has **2 children**.

(b) 3 people = $\frac{15}{30}$ salary

1 person = $\frac{5}{30}$ salary

$\frac{5}{30}$ Salary = $215

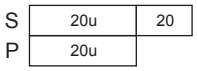
$\frac{1}{30}$ Salary = 215 ÷ 5 = 43

$\frac{3}{30}$ Salary = 3 × 43 = 129

Calissa spends **$129** on transport.

8.

<u>At first</u>



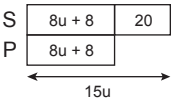
	Left	Remaining
S	$\frac{3}{5}$	$\frac{2}{5}$
P	$\frac{1}{4}$	$\frac{3}{4}$

S: 20u × $\frac{2}{5}$ = 8u

S: 20 × $\frac{2}{5}$ = 8

P: 20u × $\frac{3}{4}$ = 15u

<u>In the end</u>



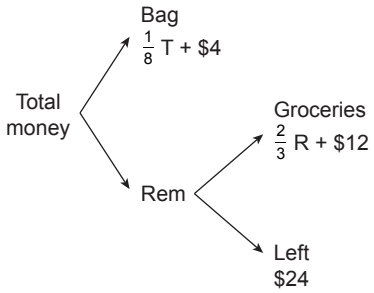
7u = 28

1u = 4

20u = 80

There were **80 powerboats** at first.

9.



$\frac{1}{3}$ Rem = 24 + 12 = 36

$\frac{3}{3}$ Rem = 3 × 36 = 108

$\frac{7}{8}$ Total – 4 = $108

$\frac{7}{8}$ Total = 108 + 4 = 112

$\frac{1}{8}$ Total = 112 ÷ 7 = 16

Cost of bag = 16 + 4 = 20

The bag cost **$20**.

10. $\frac{3}{8}$ C = $\frac{1}{4}$ T

$\frac{3}{8}$ C = $\frac{3}{12}$ T

C : T

8 : 12

Since equal number of cakes and tarts were sold, the difference between them did not change.

4u = 60

1u = 60 ÷ 4 = 15

12u = 12 × 15 = 180

180 – 36 = 144

144 tarts were left in the end.

11. ∠BAD = 180° – 65° (∠BAD and ∠ADC are interior ∠s.)

= 115°

∠FAB = 180° – 46° – 115° (adj. ∠s on a str. line)

= 19°

∠BCF = 180° – 19° – 115° – 35° (sum of ∠s in a Δ)

= **11**°

∠BCF = **11**°

12.

	X	S
At first	4u	5u
Change	–80u	+70
End	2p	3p

(Working)

	X	S
At first	12u	10u
Change	–240	+140
End	6p	6p

S	10u	140	240
X	10u	2u	

2u = 240 + 140 = 380

1u = 380 ÷ 2 = 190

4u – 80 = 4 × 190 – 80 = 680

Xavier has **$6.80**.

13. OY = AB = 7 cm

Area of quadrant XY = $\frac{22}{7}$ × 7 × 7 × $\frac{1}{4}$ = 38.5 cm^2

Given that ABCD = 48 cm

BC = (48 – 14) ÷ 2 = 17 cm

WX = 17 – 7 = 10 cm

Since WX = YZ = AY = OB and CW = $\frac{1}{2}$ WX

5u = 10

1u = 10 ÷ 5 = 2

2u = 2 × 2 = 4

Radius of quadrant WZ = 7 + 4 = 11 cm

Area of quadrant WZ = $\frac{22}{7}$ × 11 × 11 × $\frac{1}{4}$

= $95\frac{1}{14}$ cm^2

Area of shaded part = $95\frac{1}{14} - 38\frac{1}{2}$

= $56\frac{4}{7}$ cm^2

The area of shaded part is **$56\frac{4}{7}$ cm**^{2}.

14. C : P M : C

$3^{\times 5}$: $2^{\times 5}$ $1^{\times 3}$: $5^{\times 3}$

15 : 10 3 : 15

C : P : M

15 : 10 : 3

Item	Qty	×	Value ($)	Total ($)
Crayfish	15u	×	27	405u
Prawns	10u	×	18	180u
Mussels	3u	×	23	69u
Total	28u			654u

654u = 12 426

1u = 12 426 ÷ 654 = 19

7u = 7 × 19 = 133

The difference in mass was **133 kg**.

15. In 1 day

$J = \frac{1}{9}$ R

$J + K = \frac{1}{6}$ R

$J + L = \frac{1}{5}$ R

$K + L = \frac{1}{6} + \frac{1}{5} - 2(\frac{1}{9})$

$= \frac{13}{90}$

Fraction of roof completed in 2 days by J + K

$= \frac{1}{6} \times 2 = \frac{1}{3}$ R

Fraction of remaining roof completed by K + L

$= \frac{6}{6} - \frac{1}{3} = \frac{2}{3}$ R

Days taken by K + L $= \frac{2}{3} \div \frac{13}{90} = 4\frac{8}{13}$ days

Total no. of days $= 2 + 4\frac{8}{13} = 6\frac{8}{13}$ days

It takes $\mathbf{6\frac{8}{13}}$ **days** to repair the roof.

16. (a)

Figure	No. of hearts	No. of circles	Total number of shapes
5	21	15	36

(b) Figure 1 = $(1 + 1)^2 = 4$

Figure 2 = $(2 + 1)^2 = 9$

Figure 3 = $(3 + 1)^2 = 16$

Figure N = $(N + 1)^2$

Figure 111 = $(111 + 1)^2$ = **12 544**

There are **12 544 shapes** in Figure 111.

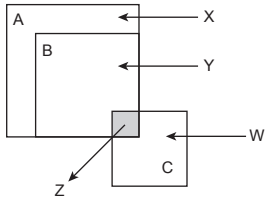
(c) $n \times \frac{(n + 1)}{2} = 9316$

$n \times (n + 1) = 18\,632$

$n = 136$

There will be 9316 white circles in **Figure 136**.

17.



		Total		A		B		B		C
W	: Z	W + Z		X + Y + Z	:	Y + Z		Y + Z	:	Z + W
$3^{\times 7}$	: $1^{\times 7}$	$4^{\times 7}$		$12^{\times 10}$	:	$7^{\times 10}$		$5^{\times 2}$	:	$2^{\times 2}$
21	: 7	28		120	:	70		$10^{\times 7}$	:	$4^{\times 7}$
								70	:	28

W	:	X	:	Y	:	Z
21	:	50	:	63	:	7

(a)

A	:	C
120	:	28
30	:	7

There ratio of the area of Square A to the area of Square C is **30 : 7**.

(b) 7u = 84

1u = 84 ÷ 7 = 12

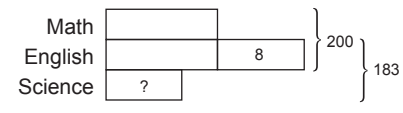
Total unshaded area = 21u + 50u + 63u = 134u

134u = 134 × 12 = 1608

The unshaded area of the figure is **1608 cm²**.

Practice Paper 2

1.



2u = 200 – 8 = 192

1u = 192 ÷ 2 = 96

Number of marks scored for Science

= 183 – 96 – 8 = 79

Rashid scored **79 marks** for Science.

2. Area of rectangle = 25 × 15 = 375 cm²

Area of Δ $= \frac{1}{2} \times 20 \times 5 = 50$ cm²

50 × 2 = 100 cm²

$2\Delta = \frac{1}{2} \times 5 \times 10 = 25$ cm²

25 × 2 = 50

Area of Δ = 150 cm²

Area of figure = 375 – 150 = **225 cm²**

3. Growth from Start to Week 1 = 6 cm – 0 cm

= 6 cm

Growth from Week 1 to Week 2 = 18 cm – 6 cm

= 12 cm

Growth from Week 2 to Week 3 = 26 cm – 18 cm
= 8 cm

Growth from Week 3 to Week 4 = 32 cm – 26 cm
= 6 cm

(a) False

The plant grew the most from Week 1 to Week 2.

(b) True

The rate of growth between the start and Week 1 is the same as the rate of growth between Week 3 and Week 4, which is 6 cm.

4. ∠BXA = 180° – 58° = 122° (∠s on a str. line)

∠AXE = 58° (alt. ∠s)

∠BAX = 180° – 30° – 122° = 28°

∠BAX is **28°**.

5. Percentage drop = $\frac{60-40}{60} \times 100\%$

$= 33\frac{1}{3}\%$

6. Participants who remained:

$\frac{4}{5}$ male = $\frac{1}{3}$ female × 2

$\frac{4}{5}$ male = $\frac{2}{3}$ female

$\frac{4}{5}$ male = $\frac{4}{6}$ female

	Total	Left	Remained
Male	5u	1u	4u
Female	6u	4u	2u

Male : Female

5 : 6

11u = 286

1u = 286 ÷ 11 = 26

5u = 5 × 26 = 130

130 participants left the course after the tea break.

7. (a)

Figure	1	2	3	4
Sum of lines and dots	8	13	18	23

+5 +5 +5

Pattern:

Figure 1 8

Figure 2 13 = 8 + 5 = 8 + 1 × 5

Figure 3 18 = 8 + 5 + 5 = 8 + 2 × 5

Figure 4 23 = 8 + 5 + 5 + 5 = 8 + 3 × 5

⋮

Figure 8 8 + 7 × 5 = 43

The sum of lines and dots in Figure 8 is **43**.

(b) 203 – 8 = 195

195 ÷ 5 = 39

39 + 1 = 40

Figure 40 has a sum of 203 lines and dots.

8. 2u × 1u = 98

1u × 1u = 98 ÷ 2 = 49

1u = 7

AE = 7 cm and AB = 14 cm

Area of shaded part

= Quadrant ED + Rectangle ABCE – semicircle

$= (\frac{1}{4} \times \frac{22}{7} \times 14 \times 14 + 98) - (\frac{1}{2} \times \frac{22}{7} \times 10.5^2)$

= 252 – 173.25

= 78.75 cm^2

The area of the shaded part is **78.75 cm^2**.

9.

At first	End
G : GF	G : GF
13 : 7 (2600)	9 : 11
20u = 2600	GF = 910 + 135 = 1045
1u = 130	11u = 1045
G = 13 × 130 = 1690	1u = 95
GF = 7 × 130 = 910	9u = 855
1690 – 855 = 835	

835 guppies were sold.

10.

Book-store				
			Bank	
	Pet Shop			
	(a) **X**			☆
			(b) ←	Food Court

(c) False

11. (a) Working backwards

	A	B	C	D
End	2u	2u	2u	2u
Change		–20	+26	÷2
At first	2u	2u – 20	2u + 26	1u

7u – 20 + 26 = 1056

7u = 1050

1u = 1050 ÷ 7 = 150

2u = 2 × 150 = 300

There were **300 cards** in Box D in the end.

(b) 300 – 20 = 280

There were **280 cards** in Box B at first.

12. (a) Surface area

$= \frac{1}{2} \times 12 \times 5 \times 2 + 3 \times 5 + 12 \times 3 + 13 \times 3$

$= 150 \text{ cm}^2$

(b) Volume of wedge $= \frac{1}{2} \times 12 \times 5 \times 3 = 90 \text{ cm}^2$

$= 90 \text{ cm}^2$

Volume of 6 cubes $= 6 \times 2 \times 2 \times 2 = 48 \text{ cm}^2$

$= 48 \text{ cm}^2$

Remaining volume $= 90 - 48 = 42 \text{ cm}^2$

$= 42 \text{ cm}^2$

Height of cheese in container $= \frac{90 - 48}{3 \times 7} = 2$ cm

The height of melted cheese is **2 cm**.

13. Given ratio = 60 : 40 = 3 : 2

Items	Quantity	×	Value ($)	Total ($)
Pack of drinks	3u	×	2.80	8.4u
Pack of drinks	2u	×	1.40	2.8u
Total	5u			11.2u

Total value of yoghurt drink sold = 8.4 + 2.8 = 11.2

11.2u = 3360

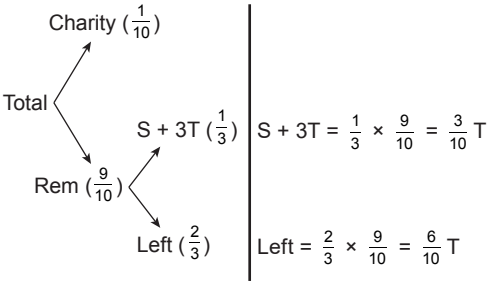
1u = 3360 ÷ 11.2 = 300

Total no. of packs = 5 × 300 = 1500

No. of bottles = 1500 × 6 = 9000

He sold **9000 bottles** of yoghurt drink.

14. (a)



$\frac{6}{10}$ Total = \$564

$\frac{1}{10}$ Total = \$564 ÷ 6 = \$94

Total = \$94 × 10 = \$940

Uncle Bert had **\$940** at first.

(b) S + 3T = $\frac{3}{10}$ T = \$282

Since 1 pair of sunglasses costs the same as 3 towels.

3T = 2S = 282

1S = 282 ÷ 2 = 141

The pair of sunglasses cost **\$141**.

15. (a) When Vanetta overtook Louis, the distance covered is the same.

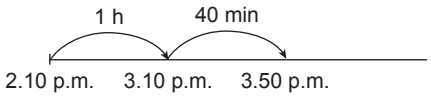
Speed			Time		
L	:	V	L	:	V
60	:	84	7	:	5
5	:	7			

Difference = 2u

2u = 40 min = $\frac{2}{3}$ h

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

5u = $\frac{1}{3} \times 5 = \frac{5}{3}$ h = $1\frac{2}{3}$ h



Vanetta overtook Louis at **3.50 p.m.**

(b) Total time for Vanetta to travel from Town X to Town Y = $1\frac{2}{3} + 2 = 3\frac{2}{3}$ h

Distance between Town X and Town Y

= $84 \times 3\frac{2}{3}$ = 308 km.

Difference between Town X and Town Y is **308 km**.

16.

	B	:	W
	$3^{\times 4}$	:	$4^{\times 4}$
Start	12u		16u
Left	9u		16u

25u + 1p = 1007

50u + 2p = 2014... (a)

28u + 2p = 1200... (b)

(a – b) 22u = 814

1u = 814 ÷ 22 = 37

12u = 12 × 37 = 444

There were **444 black marbles** in the box at first.

17. (a)

Japan				Singapore				J	:	S
M	:	F	(Total)	M	:	F	(Total)	$1^{\times 15}$	:	$3^{\times 15}$
4	:	11	15	$1^{\times 9}$	:	$4^{\times 9}$	5	15	:	45
9	:	36	45							

F (J) : F (S)

11 : 36

(b)

At first			End		
Total male	:	Total female	Total male	:	Total female
$13^{\times 7}$	:	$47^{\times 7}$	$3^{\times 49}$	:	$7^{\times 49}$
91	:	329	141	:	329

Difference in total = 141p – 91p = 50p

50p = 12 500

1p = 250

Total males at first, 91p = 91 × 250 = 22 750

Total male supporters = 13u

13u = 22 750

1u = 1750

Difference between male supporters from Singapore than Japan = 5u = 5 × 1750 = 8750

The difference is **8750 supporters**.

Practice Paper 3

1.

Class 6A				Class 6B			
P	:	R	Total	P	:	R	Total
$2^{\times 2}$	:	$1^{\times 2}$	$3u^{\times 2}$	$1^{\times 3}$	:	$1^{\times 3}$	$2u^{\times 3}$
4	:	2	6u	3	:	3	6u

5u = 100

1u = 20

4u = 80

80 pencils were distributed to Class 6A.

2. $\frac{3}{7} = \frac{9}{21}$

$\frac{20}{21} - \frac{9}{21} = \frac{11}{21}$

$\frac{11}{21}$ of total = 132 *l*

$\frac{21}{21}$ of total = 252 *l*

The tank can hold **252 *l*** of water.

3. $\frac{2}{5}$ of number = 24

$\frac{1}{5}$ of number = 12

$\frac{5}{5}$ of number = 60

$\frac{90}{100} \times 60 = 54$

90% of the number is **54**.

4. ∠ BCG = 130° (corresponding angles ∠s)

∠ CGH = **130°** (alt. ∠s)

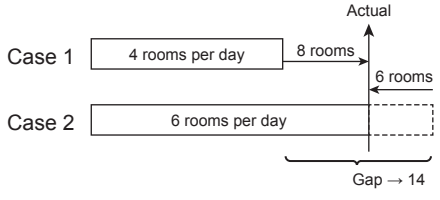
5. Science = 91 – 21 = 70

Total = 85 × 4 = 340

Mother Tongue = 340 – 70 – 91 – 89 = 90

Henry got **90 marks** for Mother Tongue.

6.



Difference = 2 rooms per day

No. of days to complete 14 rooms = 14 ÷ 2 = 7

C2 : No. of rooms = 6 × (7 – 1) = 36

Check C1 : No. of rooms = 4 × (7 + 2) = 36

There are **36 rooms** in the home.

7. **(a)** 30% of Total = 150

1% of Total = 150 ÷ 30

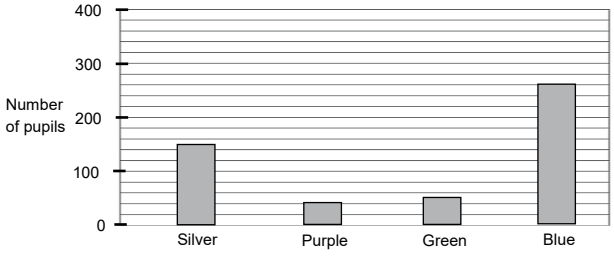
= 5

100% of Total = 100 × 5

= 500

No. of pupils who chose "Blue" = 500 – 150 – 40 – 50

= 260



(b) **(i)** **True**

Percentage of pupils who chose "Green"

$= \frac{50}{500} \times 100\%$

= 10%

(ii) **False**

No. of pupils who chose "Silver" = 150

No. of pupils who chose "Blue" = 260

8.

At first			In the end		
G	:	B	G	:	B
$4^{\times 5}$	:	$9^{\times 5}$	$5^{\times 4}$	:	$7^{\times 4}$
20	:	45	28	:	28

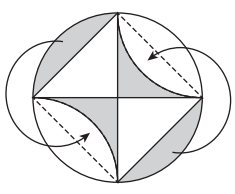
20u = 120

1u = 120 ÷ 6 = 20

17u = 17 × 6 = 102

102 boys left the party.

9.



Cut and paste to form 2 triangles of equal dimens ion.
Hence, creating 1 square of side 14 cm.

Area of shaded parts = 14 × 14 = **196 cm**^{2}

10. Area of 1 square = $\frac{32 \times 24}{12}$ = 64 cm^2

(a) Area of metal sheet to make the hollow cube
= 64 × 6 = **384 cm**^{2}

(b) Length of one side of square = $\sqrt{64}$ = 8 cm

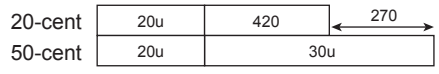
Volume of cube = 8 × 8 × 8 = **512 cm**^{2}

(c) No. of 3-cm cubes along each length, breadth and height = 8 ÷ 3 ≈ 2 cubes

Total no. of cubes = 2 × 2 × 2 = **8 cubes**

11.

Items	Quantity	×	Value (¢)	Total (¢)
20¢	1u + 21	×	20	20u + 420
50¢	1u	×	50	50u
Total	2u + 21			70u + 420



30u = 270 + 420 = 690

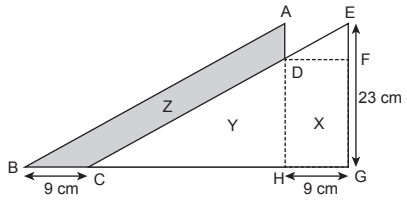
1u = 690 ÷ 30 = 23

No. of 20-cent = 23 + 21 = 44

No. of 50-cent = 23

There are **67 stamps** altogether.

12.



Since area of ΔEGC = area of ΔAHB, area of X = area of Z.

Since AD = 9 cm, DH = 14 cm.

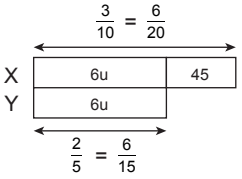
Area of FDHG = 9 × 14 = 126 cm^2

Area of ΔDEF = $\frac{1}{2}$ × 9 × 9 = 40.5 cm^2

Area of EDHG = 126 + 40.5 = 166.5 cm^2

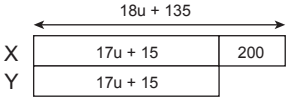
Area of shaded part = **166.5 cm**^{2}

13. After



Before (100%)

Final



(a) 18u + 135 = 17u + 15 + 200

1u = 80

Y = 17u + 15

= 17 × 80 + 15 = 1375

There are **1375 students** in Centre Y.

(b) Percentage = $\frac{200}{1575}$ × 100% ≈ 12.70%

There were **12.70%** fewer students in Centre Y than Centre X.

14. In 1 hour, the rate of burning

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

Q = $\frac{1}{9}$

R = $\frac{1}{12}$

In 6 hours,	Burnt	Left
P	$\frac{6}{7}$	$\frac{1}{7}$
Q	$\frac{6}{9}$	$\frac{3}{9}$
R	$\frac{6}{12}$	$\frac{6}{12}$

$\frac{1}{7}$ P = $\frac{3}{9}$ Q

$\frac{3}{21}$ P = $\frac{3}{9}$ Q

P : Q

21 : 9

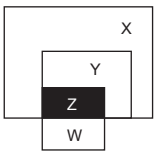
Twice the original height of Q = 2 × 9 = 18

$\frac{6}{12}$ R = 18u

$\frac{12}{12}$ R = 36u

Fraction $\frac{21}{36}$ = $\frac{7}{12}$

15.



Rectangle A = X + Y + Z

Rectangle B = Y + Z

Square C = Y + W

X + Y + Z : Y + Z : Y + W

9 : 4 : 3

Due to the overlapping area, the difference must be the same:

Y + Z : Y + W Z : W

$4^{\times 3}$: $3^{\times 3}$ (Difference $1u^{\times 3}$) 4 : 1 (Difference 3u)

12 : 9

The difference between Y+Z and Z is 8u. Hence, Y is 8u.

8u = 64

1u = 8

X + Y + Z : Y + Z : Y + W

27 : 12 : 9

15u = 15 × 8 = 120

The area of Rectangle A that is not covered by Rectangle B is **120 m²**.

16. Gary had 3u of candies and gave Russell 2u. Russell had 3p of toffees and gave Gary 2p.

	Gary		Russell	
At first	T	C	T	C
	$2p^{\times 4}$	1u	$1p^{\times 4}$	2u
Ate (Less)	–6			–6
End	2u	1u	4p	5p

Using Gary ate 6 toffees:

8p – 6 = 2u…(1)

Using Russell ate 6 candies:

2u – 6 = 5p or re-arranging 2u = 5p + 6…(2)

8p – 6 = 5p + 6

3p = 12

1p = 4

Toffees at first is 8p + 4p = 12p

12p = 12 × 4 = 48

Russell bought **48 toffees**.

17.

	Sold	Left
Meringue (Me)	$\frac{4}{5}$	$\frac{1}{5}$
Macaroon (Ma)	$\frac{1}{4}$	$\frac{3}{4}$

Since the number of meringues left is twice that of the number of macaroons left, multiply the fraction of macaroons left by 2 and then apply equal fraction:

$\frac{1}{5}$ of Me = $\frac{6}{4}$ of Ma

$\frac{6}{30}$ of Me = $\frac{6}{4}$ of Ma

Me : Ma

30 : 4

34u = 612

1u = 612 ÷ 34 = 18

Me = 30 × 18 = 540

Ma = 4 × 18 = 72

Items	Qty	×	Value ($)	Total value ($)
Me	540	×	1u	540u
Ma	72	×	1u + 0.9	72u + 64.8
	612			612u + 64.8

540u – 72u = 468u

468u = 590.40 + 64.8 = 655.20

1u = 1.40

Each meringue cost **$1.40**.

Practice Paper 4

1. S : G

5 : 7

12u = 144

1u = 12

2u = 2 × 12 = 24

Grace decorated **24 more cupcakes** than Shelly.

2. $\frac{6}{11}$ R = $\frac{2}{3}$ T

$\frac{6}{11}$ R = $\frac{6}{9}$ T

R : T

11 : 9

20u = 500

1u = 25

11u = 11 × 25 = 275

Rashid has **275 stickers** at first.

3. At first

R : B

40 : 60

In the end

R : B

25 : 18 (Total 43u)

Sold $\frac{3}{8}$ R = $\frac{15}{40}$ R

Left $\frac{25}{40}$ R

Sold $\frac{7}{10}$ B = $\frac{42}{60}$ R

Left $\frac{18}{60}$ R

Percentage of cartridge left = $\frac{43}{100}$ × 100% = 43%

43% of ink cartridge are left.

4. Daily cost of 15 bowls of noodles = 15 × 5 = $75

No. of bowls of noodles sold at $1 less (whole number only)

= 75 ÷ 4 = 18.75 ≈ 19

He must sell a minimum of **19 bowls** of noodles.

5. Total amount of money at first = 120 × 2 = $240

Amount of money in the end = 240 + 26 – 31 = $235

In the end

B : J

4 : 1

5u = $235

1u = 235 ÷ 5 = 47

1u + 31 = 47 + 31 = 78

John had **$78** at first.

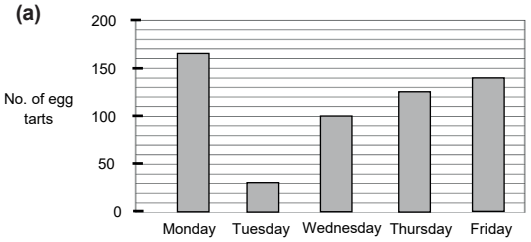
6. $\frac{3}{4}$ Total = 165 + 30 + 100 + 125

= 420

$\frac{1}{4}$ Total = 420 ÷ 3

= 140

(a)



(b) (i) False

No. of egg tarts on Friday = 140

No. of egg tarts on Wednesday = 100

(ii) Not possible to tell

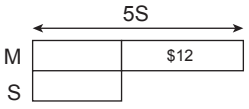
There is not enough evidence to show that there were 560 customers over the 5 days although there were 560 egg tarts sold altogether. For example, some customers may have bought more than 1 egg tart each.

7.

Set 1	1M	3M	12S
Set 2	1M	15S	12S

3M = 15S

1M = 5S



4S = 12

1S = 3

5S = 5 × 3 = 15

Each packet of mushrooms cost **$15**.

8.

Figure	1	2	3	4	....	8
No. of shapes	1	3	6	10	...	36
Sum of Conservative Number	1	1 + 2	1 + 2 + 3	1 + 2 + 3 + 4		1 + 2 + 3+...8

(a) Figure 8 = $\frac{8}{2}$ × (8 + 1) = **36 shapes**

(b) Figure × $\frac{(\text{Figure} + 1)}{2}$ = 120

Figure × (Figure + 1) = 120 × 2 = 240

Hence, **Figure 15** has 120 shapes.

(c) Figure 100 = $\frac{100}{2}$ × 100 + 1 = **5050 shapes**

9. At first

L	:	M	:	N
$5^{\times 5}$	:	$2^{\times 5}$	:	$6^{\times 5}$
25	:	10	:	30

End

L	:	M	:	N
28	:	16	:	21

7u = 140

1u = 20

(a) % increased in Lee's money = $\frac{3}{25}$ × 100% = 12%

Lee's money increased by **12%**.

(b) 30u = 30 × 20 = 600

Nate had **$600** at first.

10.

A + B	:	B + C	B	:	C	(Total)
7	:	5	1	:	3	4u
28	:	20				20u

A	:	B	:	C	(Total)
28	:	5	:	15	43u

Shaded : Figure

5 : 43

11. (a) $\frac{1}{4}$ W = $\frac{2}{7}$ M

$\frac{2}{8}$ W = $\frac{2}{7}$ M

C	:	A	M	:	W	(Adults)
$5^{\times 5}$	:	$6^{\times 5}$	$7^{\times 2}$	:	$8^{\times 2}$	$15u^{\times 2}$
25	:	30	14	:	16	30u

M	:	W	:	C
14	:	16	:	25

Ratio is **14 : 16 : 25**.

(b) At first

M	:	W	:	C	(Total)
$14^{\times 2}$	:	$16^{\times 2}$	:	$25^{\times 2}$	$55u^{\times 2}$
28	:	32	:	50	110u

In the end

Men decreased $\frac{1}{4}$ = $\frac{1}{4}$ × 28u

= 7u

Children decreased $\frac{1}{5}$ = $\frac{1}{5}$ × 50u

= 10u

17u = 85

1u = 5

Difference = 110u − 17u = 93u

93u = 465

There were **465 passengers** left on board the plane to America.

12. Common area painted

Time Ratio

Y	:	P	Y
9	:	6	2
3	:	2	

Rate Ratio

	:	P
	:	3

In the end, area painted

Y	:	P	(Diff)
$2^{\times 2}$	:	$3^{\times 2}$	$1^{\times 2}$
4	:	6	2

In the end, area unpainted

Y	:	P	(Diff)
5	:	3	2

Y = 4u + 5u = 9u

9u = 9

1u = 1

4u = 4

It would take **4 hours**.

13. Area of PQU = $\frac{1}{2}$ × 18 × 9 = 81 cm^2

Area

PQT	:	QUT	:	PQU
2	:	1	:	3

Area of QUT = $\frac{1}{3}$ × 81 = 27

Area of SRQ = $\frac{1}{2}$ × 18 × 18 = 162

Area of shaded part = 162 – 27 = 135

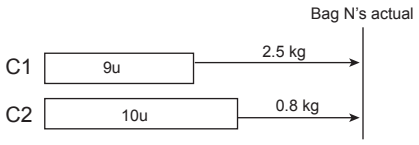
The area of the shaded part is **135 cm²**.

14.

Case 1: N $\xrightarrow{2\frac{1}{2}\text{ kg}}$ M Case 2: N $\xrightarrow{\frac{4}{5}\text{ kg}}$ M

N	:	M	(Total)
$3^{\times 3}$	:	$1^{\times 3}$	$4u^{\times 3}$
9	:	3	12u

N	:	M	(Total)
$5^{\times 2}$	:	$1^{\times 2}$	$6u^{\times 2}$
10	:	2	12u



1u = 2.5 – 0.8 = 1.7

Using C1, N = 9u + 2.5

= 9 × 1.7 + 2.5 = 17.8

C2, N = 10u + 0.8

= 10u × 1.7 + 0.8 = 17.8

The mass of Bag N was 17.8 kg at first.

N = 17.8

M = 3u – 2.5

= 3 × 1.7 – 2.5 = 2.6

50% of M = 2.6 × $\frac{1}{2}$ = 1.3

Mass of N (End) = 17.8 + 1.3 = 19.1

The mass of Bag N in the end is **19.1 kg**.

15.

Package X			
R	:	B	(Total)
$3^{\times 5}$	:	$5^{\times 5}$	$8u^{\times 5}$
15	:	25	40u

Package Y			
R	:	B	(Total)
7	:	9	16u

Package X	:	Package Y
5	:	2
40	:	16

(a) Rolls of red tape

Box X : Box Y

15 : 7

(b)

At first (Y)		
R	:	B
$7^{\times 5}$	:	$9^{\times 5}$
35	:	45

In the end (Y)		
R	:	B
$5^{\times 7}$	:	$11^{\times 7}$
35	:	77

No. of rolls of black tape increased in Package Y

= 77u – 45u = 32u

32u = 64

1u = 2

At first,

X			(Total)
R	:	B	
$15^{\times 5}$	:	$25^{\times 5}$	$40u^{\times 5}$
75	:	125	200u

Package X = 200u – 32u = 168u

168u = 168 × 2 = 336

There were **336 rolls of tape** in Package X in the end.

16.

$2	:	$5	:	$10
4	:	5	:	3
$16^{\times 5}$	:	$20^{\times 5}$	:	$12^{\times 5}$
80	:	100	:	60

Left

$2	$5	$10
64u	100u – 30	15u

Item	Quantity	×	Value($)	Total ($)
$2	64u	×	2	128u
$5	100u – 30	×	5	500u – 150
$10	15u	×	10	1500
Total				778u – 150

778u = 2184 + 150 = 2334

1u = 2334 ÷ 778 = 3

Value of $2 = 3 × 80 × 2 = 480

Value of $5 = 3 × 100 × 5 = 1500

Value of $10 = 3 × 60 × 10 = 1800

Total = 480 + 1500 + 1800 = 3780

There was **$3780** in the safe at first.

17. Volume of hollow-section

= 12 × 12 × 20

= 2880 cm³

Volume of water in tank

= 32 × 30 × 20 – 12 × 12 × 20

= 16 320 cm³

In Figure 2,

Volume of water in tank when the water level is 12 cm

= (40 – 12) × 20 × 12

= 6720 cm³

Volume of water remaining above 12 cm

= 16 320 – 6720

= 9600 cm³

Base area above 12 cm = 40 × 20 = 800 cm²

Height above 12 cm to water level

= 9600 ÷ 800 = 12

Height of water in Figure 2 = 12 + 12 = 24

The height of water in Figure 2 is **24 cm**.

Practice Paper 5

1. 2 h = 3 min faster

12 h = 18 min faster

Time shown on her watch 12 hours later = 13 00 + 18

= **13 18**

2.

Distance Ratio			Speed Ratio		
N	:	P	N	:	P
8	:	7	8	:	7

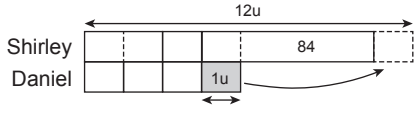
8u = 240

1u = 30

7u = 210

Peter's speed was **210 m/min**.

3.



Difference = 12u – 5u = 7u

7u = 84

1u = 84 ÷ 7 = 12

15u = 15 × 12 = 180

They had **180 books** altogether.

4. $\frac{3}{7}$ L = $\frac{1}{5}$ F

$\frac{3}{7}$ L = $\frac{3}{15}$ F

L : F

7 : 15

Difference = 15u – 7u = 8u

8u = 32

1u = 4

7u = 7 × 4 = 28

Larry's age in 3 years' time = 28 + 3 = 31

Larry will be **31 years old** in 3 years' time.

5.

Items	Qty	×	Value (cents)	Total (cents)
10-cent	1u	×	10	10u
20-cent	5u	×	20	100u
50-cent	1u	×	50	50u
Total	7u			160u

160u = 1600

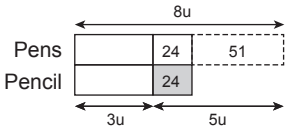
1u = 10

Value of 50-cent coins = 50u

50u = 50 × 10 = 500

Ethel had **$5** worth of 50-cent coins.

6.



5u = 75

1u = 15

3u + 24 = 3 × 15 + 24 = 69

There were **69 pencils** in the box in the end.

7. Area of ∆ABH = ∆HGF = ∆FED = ∆BCD

= $\frac{1}{2}$ × 12 × 18 = 108 cm^2

Area of rhombus = $\frac{1}{2}$ × 24 × 9 × 2 = 216 cm^2

Total shaded area = 216 + 108 × 4 = 648 cm^2

Area of rectangle ACEG = 36 × 24 = 864 cm^2

Area of unshaded area = 864 – 648 = 216 cm^2

Fraction of unshaded to shaded area = $\frac{216}{648}$ = $\frac{1}{3}$

8. Mass of container = 90 g

Mass of 2 squares = 420 g – 90 g

= 330 g

Mass of 1 square = 330 g ÷ 2

= 165 g

Mass of 1 triangle = 510 g – 90 g – 165 g

= 255 g

Mass of 1 circle = 690 g – 510 g

= 180 g

(a) True

The mass of the triangle (255 g) is more than the mass of the square (165 g).

(b) False

The mass of 3 circles (3 × 180 g = 540 g) is not less than the mass of 2 triangles (2 × 255 g = 510 g).

9.

At first	B	:	G	(Diff)	In the end	B	:	M	(Diff)
	$4^{\times 3}$	:	$3^{\times 3}$	$1u^{\times 3}$		8	:	5	3u
	12	:	9	3u					

Total at first = 12u + 9u = 21u

21u = 105

1u = 5

4u of boys and 4u of girls left.

No. of children who left = 8 × 5 = 40

40 children left the school hall.

10. 1 set (4 pay + 1 free) = $4

No. of sets = 163 ÷ 4 = 40 R 3

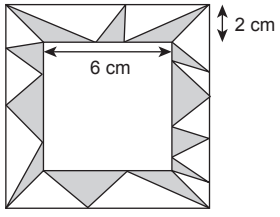
No. of bonbons in 40 sets = 40 × 5 = 200

Remaining $3 = $3 ÷ $1 = 3 (extra bonbons)

Total = 200 + 3 = 203

Customer can buy **203 bonbons**.

11.



The sum of the bases of the shaded triangle = Perimeter of smaller square

= 6 × 4 = 24 cm

Since they are triangles,

Area of shaded region = $\frac{1}{2}$ × 24 × 2 = 24 cm^2

The area of the shaded region is **24 cm^2**.

12. (a) DB = CA (diagonals) where CA is the radius.

BD = CA = q cm

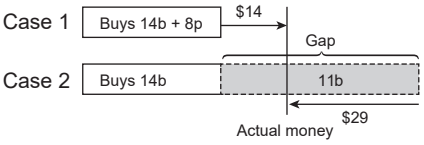
(b) DC = (q – 2) cm

BD = q cm

BC = $\frac{q}{2}$

Perimeter = **(2.5q – 2) cm**

13. (a)



Total cost of 8 pencils = 8 × 1.50 = $12

If Dinesh did not buy 8 pencils, he would have an additional $12.

Gap = 12 + 14 + 29 = $55

Difference = 11 books

Cost of 1 book = 55 ÷ 11 = 5

Using Case 1:

Amount of money Dinesh has

= 14 × 5 + 12 + 14 = 96

Check using Case 2:

Amount of money Dinesh has = 25 × 5 – 29 = 96

Dinesh has **$96**.

(b) No. of books Dinesh could buy with all his money

= 96 ÷ 5 = 19 R 1

Dinesh could buy **19 books** with all his money.

14. For odd rows,

- The queue no. in the 4th column is the row no. × 4
- The queue no. in the 1st column is the row no. × 4 – 3

For even rows,

- The queue no. in the 1st column is the row no. × 4
- The queue no. in the 4th column is the row no. × 4 – 3

(a) To find which row = $\frac{\text{(queue no. + 3)}}{4}$

Row no. = $\frac{(153 + 3)}{4}$ = 39

4th column of row 39 = 39 × 4 = 156

156 – 153 = 3 (1st column)

Jason was waiting in **Row 39, Column 1**.

(b) For even rows 4th column, 92 × 4 – 3 = 365

There were **365 people** in front of Patricia.

15.

No. of strawberry	Cost of strawberry ($3)	No. of chocolate	Cost of chocolate ($5)	Difference
0	0 × 3 = 0	18	18 × 5 = 90	90
1	1 × 3 = 3	19	19 × 5 = 95	92

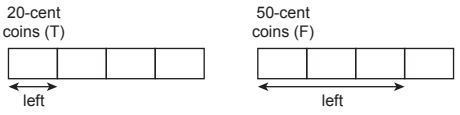
Total difference = 210 – 90 = 120

No. of tubs of strawberry ice-cream = 120 ÷ 2 = 60

No. of tubs of chocolate ice-cream = 60 + 18 = 78

Jasline bought **60 tubs** of strawberry ice-cream and **78 tubs** of chocolate ice-cream.

16. (a)



4T + 4F = 80 coins...(a)

1T + 3F = 32 coins...(b)

4T + 12F = 128 coins...(c)

4T + 12F – 4T – 4F = 128 – 80... c – a

8F = 48 coins

1F = 48 ÷ 8 = 6

4F = 4 × 6 = 24

No. of 50-cent coins = 24

Percentage of 50-cent coins at first

$= \frac{28}{40} \times 100\% = 30\%$

30% of the coins in the box is 50-cent coins.

(b) 4T = 80 – 24 = 56 coins

1T = 14 coins

3T = 3 × 14 = 42

Value of 20-cent coins used = 0.2 × 42 = 8.40

Value of 50-cent coins used = 0.5 × 6 = 3

Total cost of boardgame = 3 + 8.40 = 11.40

The boardgame cost **$11.40**.

17. Area of big quadrant = $\frac{1}{4} \times 3.14 \times 16 \times 16 = 200.96\ cm^2$

Area of big triangle = $\frac{1}{2} \times 16 \times 16 = 128\ cm^2$

Area of $\frac{1}{2}$ rugby formed between big quadrant and big triangle = 200.96 – 128 = 72.96 cm^2

Area of big rugby shape = 72.96 × 2 = 145.92 cm^2

Area of small quadrant = $\frac{1}{4} \times 3.14 \times 8 \times 8 = 50.24\ cm^2$

Area of small triangle = $\frac{1}{2} \times 8 \times 8 = 32\ cm^2$

Area of small rugby formed between small triangle and small quadrant = 50.24 – 32 = 18.24 cm^2

Area of 1 small rugby = 18.24 × 2 = 36.48 cm^2

Total shaded area = 145.92 – 36.48 = 109.44 cm^2

The total shaded area is **109.44 cm^2**.

Practice Paper 6

1. At first

M	:	C	:	W(Total)
4	:	1	:	5 10u

10u = 5000

1u = 5000 ÷ 10 = 500 (children)

4u = 4 × 500 = 2000 (men)

5u = 5 × 500 = 2500 (women)

In the end

$\frac{1}{2}$ of Total = 2000 (Men didn't change)

$\frac{1}{2}$ of Total = 2000 (Children + Women)

No. of children remained = 500 ÷ 2 = 250

No. of women remained = 2000 – 250 = 1750

1750 women remained at the musical.

2.

J	:	A		B	:	J
2	:	1		3	:	1
				6	:	2

J	:	A	:	B
2	:	1	:	6

5u = 45 – 3*a*

1u = 9 – $\frac{3}{5}$a

Anthony = **9 – $\frac{3}{5}$*a***.

3.

At first					In the end				
A	:	B	:	C	A	:	B	:	C
2	:	3	:	5	7	:	9	:	13
4	:	6	:	10					

3u = 36

1u = 36 ÷ 3 = 12

9u = 9 × 12 = 108

Class B had **108 goodie bags** in the end.

4. At first

Wong = 10 + 6*x*

Heng = 10 + 15*x*

Wong gave = 5 + 3*x*

Heng bought = 10 + 6*x*

Heng's (end) = 10 + 6*x* + 10 + 15*x* + 5 + 3*x*

= 25 + 24*x*

Wong's (end) = 5 + 3*x*

Total (end) = **30 + 27*x***

5.

Item	Quantity	×	Value	Total
A	390	×	5u	1950u
C	180	×	3u	540u
Total	570			2490u

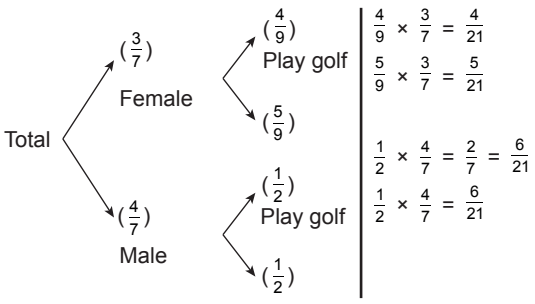
2490u = 12 450

1u = 5

5u = 5 × 5 = 25.

Each adult ticket cost **$25**

6.



$\frac{4}{21} + \frac{6}{21} = \frac{10}{21}$

$\frac{10}{21}$ of the members play golf.

7. **(a)** Steven's distance travelled after meeting Jerry = 2 × 80 km/h + 20 km = 180 km

Jerry met Steven at 12 p.m.

Jerry's average speed = 180 km ÷ 2 h = **90 km/h**

(b) Time taken for Steven to meet Jerry after leaving Desaru = 180 ÷ 80 = 2 h 15 min

Time Steven left Desaru = 2 h 15 min before 12 p.m.

= **9.45 a.m.**

8. **(a)** Interior side of square box = 29 – 10 cm = 19 cm

Volume = 19 × 19 × 29 = **10 469 cm**^{3}

(b) Remaining surface area

= (2 cm × 50 cm) × 2 + (5 cm × 50 cm) × 2 + (2 cm × 5 cm) × 2 + (58 cm × 2 cm) × 2 + (58 cm × 5 cm) × 2

= 200cm^2 + 500cm^2 + 20 cm^2 + 232 cm^2 + 580 cm^2

= **1532 cm**^{2}

9. Area of shaded part : Area of unshaded part

1 : 6

Sum of area of ABCD and PQR = 1u + 6u + 1u = 8u

1 m = 100 cm

Hence, 1 m^2 = 100 × 100 = 10 000 cm^2

5 m^2 = 5 × 10 000 = 50 000 cm^2

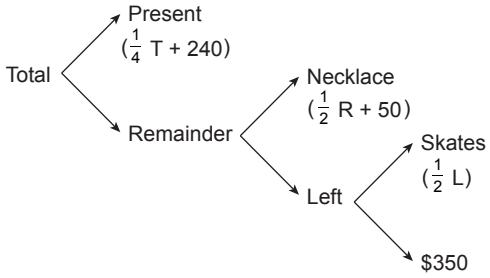
8u = 50 000

1u = 50 000 ÷ 8 = 6250

6u = 6 × 6250 = 37 500

The area of the unshaded part is **37 500 cm**^{2}.

10.



Left = 2 × 350 = $700

$\frac{1}{2}$ R = 700 + 50 = $750

R = 2 × 750 = $1500

$\frac{3}{4}$ T = 1500 + 240 = 1740

$\frac{1}{4}$ T = 1740 ÷ 3 = 580

Total = 4 × 580 = $2320

Mrs Tan had **$2320** at first.

11. In ΔBEF,

∠BFE = 180° − 60° × 2 = 60°

∠FBE = 90° (corner of rectangle)

∠FEB = 90° – 60° = 30°

In ΔGED, ∠GED = (180° − 90°) ÷ 2

= 45° (base ∠s, isos Δ)

∠BEG = 180° – 30° – 30° – 45° – 45°

= **30°** (sum of ∠s on a straight line)

12. **(a)** **True**

∠FGB = ∠EAB (folded from the right-angled corner)

= 90°

(b) **False**

∠ABE = ∠EBG + (2 × ∠GBF) or ∠EBF + ∠GBF

(c) **True**

∠AEB = 180° – 90° – 40°

= 50° (∠s in a triangle)

= ∠BEF (folded)

∠FED = 180° – 50° – 50° (∠s on a straight line)

= 80°

13.

Tennis	:	Total	Basketball	:	Total
4	:	7	3	:	5
20	:	35	21	:	35

T + B = 41

Diff = 41 – 35 = 6

6u = 120

1u = 20

35u = 35 × 20 = 700

There are **700 students** in the school.

14. (a) For odd Figures, the number of triangles

= Figure number × 2

For even Figures, number of triangles

= Figure number × 2 – 1

Number of triangles in Figure 7 (odd) = 7 × 2 = 14

There are **14 triangles** in Figure 7.

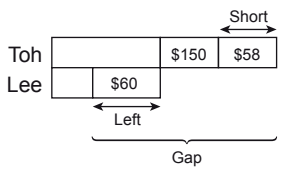
(b) Number of triangles in Figure 20 (even)
= 20 × 2 – 1 = **39 triangles**

(c) 99 + 1 = 100

100 ÷ 2 = 50

Figure 50 will have 99 triangles.

15.



(a) Gap = $60 + $150 + $58 = $268

Difference in discount = 20%

20% → 268

10% → 134

100% → 1340

The price of shoes was **$1340**.

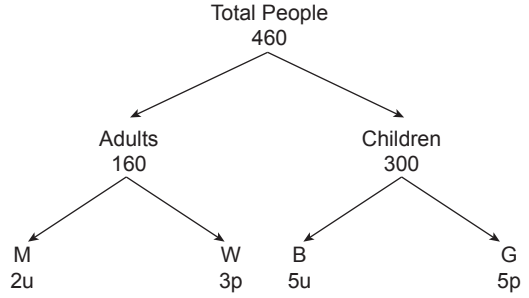
(b) Mrs Lee would pay = 40% of 1340 = 804

Mrs Lee's money = 804 + 60 = 864

Mrs Toh's money = 864 + 150 = 1014

Mrs Lee and Mrs Toh brough **$864** and **$1014** respectively.

16.



Adults = (460 – 140) ÷ 2 = 160

Children = 160 + 140 = 300

$5u^{\div 5} + 5p^{\div 5} = 300^{\div 5}$

$1u^{\times 5} + 1p^{\times 5} = 60^{\times 5}$

2u + 2p = 120 …. (a)

2u + 3p = 160 … (b)

(b) – (a) 1p = 40

1u = 20

(a) 3p = 120

2u = 40

Percentage of women among the adults

$= \frac{120}{160} \times 100\% = 75\%$

75% of the adults were women.

(b) 5u = 100 boys

5p = 200 girls

Percentage of boys among total

$= \frac{100}{460} \times 100\% \approx 21.74\%$

21.74% of the people at the zoo were boys.

17. Area of small rugby ball

= 2 × (Area of small quadrant – area of small triangle)

$= 2 \times (\frac{1}{4} \times \pi \times 8 \times 8 - \frac{1}{2} \times 8 \times 8)$

$= 2 \times (16\pi - 32)$

$= 32\pi - 64$

$= 36.53 \text{ cm}^2$

Area of $\frac{1}{2}$ big rugby ball

= Area of big quadrant – Area of triangle

$= \frac{1}{4} \times \pi \times 16 \times 16 - \frac{1}{2} \times 16 \times 16$

$= 64\pi - 128 = 73.06$

Area of shaded part = 73.06 – 36.53 = 36.53 cm^2

Area of unshaded part

= Area of triangle – Area of shaded part

$= \frac{1}{2} \times 16 \times 16 - 36.53$

$= 128 - 36.53 = 91.47$

The area of the unshaded part is **91.47 cm²**.

Practice Paper 7

1.

End			At first		
B	:	P	B	:	P
2	:	2	3	:	2u + 50

$5u + 50 = 615$

$5u = 565$

$1u = 113$

Pies = $113 \times 2 + 50 = 276$

Buns = $113 \times 3 = 339$

Difference = $339 - 276 = 63$

The difference between the number of pies and buns at the cafe at first was **63**.

2.

At first			End		
A	:	D	A	:	D
$1^{\times 6}$	:	$1^{\times 6}$	(1)	:	6
(6)	:	6			

5u

$5u = 325$

$1u = 325 \div 5 = 65$

$6u = 6 \times 65 = 390$

Money from sale = $\frac{390}{6} \times 1 = \$65$

Cost of stamps = $390 \times 0.10 = 39$

Earn = $65 - 39 = 26$

Daisy earned **$26**.

3. Profit from each sardine bun = $2.20 − $1.20 = $1

Profit from each sausage bun = $2.50 − $1.20 = $1.30

Total no. of buns sold = 291

Sardine	Profit ($)	Sausage	Profit ($)	Total Profit ($)	Check
291	291	0	0	291	×
290	290	1	1.30	291.3	×
221	221	70	91	312	✓

Target difference = 312 − 291 = 21

No. of sausage buns sold = 21 ÷ 0.3 = 70

No. of sardine buns sold = 291 − 70 = 221

Julie sold **70 sausage buns** and **221 sardine buns**.

4. Time taken by car to reach Town Y from 10.30 a.m. to 12 noon = $1\frac{1}{2}$ h

Distance between Town X and Town Y

= $60 \times 1\frac{1}{2}$ h = 90 km

Distance motorcycle covered = 90 – 75 = 15 km

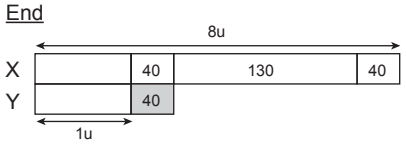
Time taken for the motorcycle to travel 15 km

= 15 ÷ 50 = 18 min

Time motorcycle left Town X, which is 18 min before 12 noon = **11.42 a.m.**

5. At first

End



$7u = 210$

$1u = 210 \div 7 = 30$

No. of erasers in Box X at first = 240 – 40 = 200

There were **200 erasers** in Box X at first.

6.

At first				In the end			
J	:	M	(Total)	J	:	M	(Total)
$4^{\times 11}$	:	$3^{\times 11}$	$7u^{\times 11}$	$4^{\times 7}$	:	$7^{\times 7}$	$11u^{\times 7}$
44	:	33	77	28	:	49	77

Difference = 44u – 28u = 16u

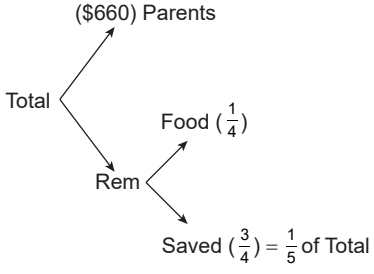
$16u = 48$

$1u = 48 \div 16 = 3$

$77u = 77 \times 3 = 231$

They had **231 candies** altogether.

7.



(a) $\frac{3}{4}$ Rem = $\frac{1}{5}$ Total

$\frac{1}{4}$ Rem = $\frac{1}{5} \div 3 = \frac{1}{15}$ Total

$\frac{4}{4}$ Rem = $4 \times \frac{1}{15} = \frac{4}{15}$ Total

$\frac{11}{15}$ Total = 660

$\frac{1}{15}$ Total = $660 \div 11 = 60$

David spent **$60** on food.

(b) $\frac{15}{15}$ Total = $15 \times 60 = 900$

David's monthly salary was **$900**.

8.

Figure No.	No. of traingles	No. of squares	Are of figure (cm^2)
1	1	0	0.5
2	2	1	2
3	3	3	4.5
4	4	6	8
...	...	...	...
	Figure no.	$\frac{\text{Fig no.} \times (\text{Fig no} - 1)}{2}$	$\frac{(\text{Fig no.} \times \text{Fig no})^2}{2}$

(a) No. of traingles in Figure 7 = 7

No. of squares in Figure 7 = $(7 \times 6) \div 2 = 21$

Are of figure in Figure 7 = $(7 \times 7)^2 \div 2 = 24.5$

= **24.5 cm^2**

(b) No. of squares in Figure 12 = $(12 \times 11) \div 2$ = **66**

(c) By working backwards,

220.5 x 2 = 441

$\sqrt{}$ 441 = 21 (square root of 441= 21)

There are **21 triangles** in the figure.

9. At first

C	:	S	(Total)
$3^{\times 8}$	:	$2^{\times 8}$	5u
24	:	16	40u

No. of units of cookies left in the end = $\frac{5}{8} \times 40u = 25u$

No. of units of chocolate cookies left = $\frac{3}{4} \times 24u = 18u$

No. of units of strawberry cookies left = 25u – 18u = 7u

No. of unit of strawberry cookies sold = 16u – 7u = 9u

9u = 72

1u = 72 ÷ 9 = 8

15u = 15 × 8 = 120

120 cookies were sold.

10. (a) Perimeter = 3 large quadrants + 2 small semi-circle + 28

$= \frac{3}{4} \times \pi \times 28 + \pi \times 14 + 28$

$= 35\pi + 28$

= **138 cm^2**

(b) Area of A = Big semicircle – Small unshaded circle

$= \frac{1}{2} \times \pi \times 14 \times 14 - \pi \times 7 \times 7$

$= 98\pi - 49\pi$

$= 49\pi$

= **154 cm^2**

11.

	R	P
Case 1	5u	$1u^{\times 4}$
Change	–40	$+30^{\times 4}$
Case 2	4p	$1p^{\times 4}$

Working	R	P
	5u	4u
	–40	+120
	4p	$1p^{\times 4}$

R	5u			
P	4u	40	120	

1u = 160

Red = 5 × 160 = 800

Purple = 160 + 30 = 190

Total = 800 + 190 = 990

There are **990 highlighters** in the box.

12. Pecan pies = (80 – 10) ÷ 2 = 35

Cheesecakes = 35 + 10 = 45

	P	C
At first	$35^{\times 2}$	$45^{\times 3}$
Change	$-2u^{\times 2}$	$-3u^{\times 3}$
End	$3p^{\times 2}$	$2p^{\times 3}$

(Working)

	P	C
At first	70	135
Change	–4u	–9u
End	6p	6p

P	9u		70
C	4u	135	

5u = 135 – 70 = 65

1u = 65 ÷ 5 = 13

No. of cheesecakes sold = 3 × 13 = 39

Chef Celia sold **39 cheesecakes**.

13. Volume of water in A = $20 \times 16 \times 60 \times \frac{3}{4} = 14\,400\ cm^2$

Volume of water in C = $15 \times 16 \times 24 \times \frac{1}{5} = 1152\ cm^2$

Total volume = 14 400 + 1152 = 15 552 cm^2

Combined base area for the 3 tanks
= (20 × 16) + (30 × 16) + (15 × 16) = 1040 cm^2

Height of the water level after the plastic sheets are removed = 15 552 ÷ 1040 ≈ **15 cm**

When 18 208 cm^3 of water was added, Tank C being smaller was filled entirely and tanks A and b will have a new height.

Total volume in the 3 tanks = 15552 + 18 208
= 33 760 cm^3

Volume of water in Tank C when full = 24 × 15 × 16
= 5760 cm^3

Volume of water in tanks A and B = 33 760 – 5760
= 28 000 cm^3

Combined base area of tanks A and B
= (20 × 16) + (30 × 16) = 800 cm^2

Height of water in Tank A = 28 000 ÷ 800 = 35

The height of water in Tank A is **35 cm**.

14. (a) Percentage of consumers who chose "size"
= 25% – 20% = **5%**

(b) 100% → 360

1% → 3.6

Percentage of consumers who chose "Electricity Consumption" = 50% – 10% = 40%

No. of people who chose "Electricity Consumption"
= 40 × 3.6 = 144

144 people chose "Electricity Consumption".

(c) 12u = 144

1u = 144 ÷ 12 = 12

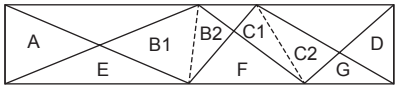
7u = 12 × 7 = 84

No. of females who were not homemakers

= 84 – 34 = 50

50 females were not homemakers.

15.



Area of B1 = Area of A (A and E, B1 and E are common base triangles, same base)

Area of B2 = Area of C1 (B2 and F, C1 and F are common base triangles, same height)

Area of D = Area of C2 (C2 and G, D and G are common base triangles, same height)

Area of B and D = Area of A and C

= **83 cm**^{2}

16. Tank A Base Area = 50 × 20 = 1000

Tank B Base Area = 30 × 10 = 300

In 1 minute,

Rate of increase in water level in A = $\frac{1500}{1000}$
= 1.5

Rate of increase in water level in B = $\frac{1500}{300}$
= 5

After 1 min water increases at 1.5 //min but decreases at 0.3 //min = 1200 cm^3/min

In 1 minute,

Rate of increase in water level in B = $\frac{1200}{300}$
= 4

Head start in A = $\frac{7}{10} \times 30 = 21$ cm

After 1 min A increased to 21 + 1.5 = 22.5 cm

After 1 min B increased to 5 cm

Head start after 1 min = 22.5 – 5 = 17.5 cm

Difference in speed of increase = 4 – 1.5 = 2.5 cm

Time to catch up = $\frac{17.5}{2.5}$ = 7 min

1 min + 7 min = 8 min

It took **8 min** for the heights to become equal.

17. (a) Volume of water added to the tank = 9 *l* × 4 = 36 *l*
36 *l* = 36 000 cm^3

$\frac{4}{5}$ Tank = 36 000 cm^3

$\frac{1}{5}$ Tank = 36 000 ÷ 4 = 9000 cm^3

$\frac{5}{5}$ Tank = 9000 × 5 = 45 000 cm^3

Base area = 75 × 20 = 1500 cm^2

Height of Tank X = 45 000 ÷ 1500 = **30 cm**

(b) Volume of water transferred = 45 000 cm^3

Rise in water level = 25 – 7 = 18

Area of square base = 45 000 ÷ 18 = 2500

2500 = 50 × 50

The length of Tank Y is **50 cm**.

Practice Paper 8

1.

	A				P		
A	: P	R	: NR	(Total)	R	: NR	(Total)
$3^{\times 4}$	: $7^{\times 4}$	$2^{\times 12}$	: $3^{\times 12}$	$5u^{\times 12}$	$1^{\times 7}$	: $3^{\times 7}$	$4u^{\times 7}$
$12^{\times 5}$	: $28^{\times 5}$	24	: 36	60u	$7^{\times 5}$	: $21^{\times 5}$	$28u^{\times 5}$
60	: 140	35	: 105	140u			

59u = 354

1u = 6

200u = 200 × 6 = 1200

There was a total of **1200 fruits**.

2. Men = 25%

Girls = 20%

Boys + Women = 100% – 25% – 20%

= 55%

Women = $\frac{3}{11}$ × 55%

= 15%

Boys = $\frac{8}{11}$ × 55%

= 40%

(a) False

Males (Men + Boys) = 25% + 40%

= 65%

Females (Women + Girls) = 15% + 20%

= 35%

Difference = 65% – 35%

= 30%

Males more than females = $\frac{30}{35}$ × 100%

≈ 85.71%

(b) Not possible to tell

There is not enough evidence to show that there were more fathers than mothers although there were more men than women.

3. Fraction of cordial he used for 4 days = $\frac{1}{5}$

Fraction of cordial he used for 1 day = $\frac{1}{5} \div 4 = \frac{1}{20}$

Fraction of cordial used in 11 days = $\frac{1}{20} \times 11 = \frac{11}{20}$

Fraction of remaining cordial = $\frac{20}{20} - \frac{11}{20} = \frac{9}{20}$

9u = 1.8 *l*

1u = 1.8 ÷ 9 = 0.2 *l*

20u = 20 × 0.2 = 4 *l*

The volume of lime cordial in the bottle at first was **4 *l***.

4. 41 children = 246

1 child = 246 ÷ 41 = 6

114 children = 114 × 6 = 684

There were **684 ice-cream cones** in the box at first.

5. $\frac{2}{5}$ T = 3 highlighters

$\frac{6}{15}$ T = 3 highlighters

1 highlighter = $\frac{2}{15}$ T

4 highlighters = $\frac{8}{15}$ T

2 rulers = $\frac{1}{15}$ of the money

1 ruler = $\frac{1}{30}$ of the money

Hence **30 rulers** can be purchased.

6. ∠QFG = 180° – 40° – 25 (sum of angles in a Δ)

= 115°

∠EFQ = 180° – 115° (angles on a straight line)

= 65°

∠EQF = 180° – (65° × 2) (base angles in an isos Δ)

= 50°

∠PQR = 70° (opposite angles)

∠PQE = 70° – 50°

= **20**°

7. (a) PU = PQ = 14 cm

PR = 14 + 7 = 21

Area of rectangle = 21 × 14 = **294 cm**^{2}

(b) Area of shaded part = Quadrant – Semicircle

$\frac{1}{4} \times \pi \times 14 \times 14 - \frac{1}{2} \times \pi \times 7 \times 7 = 77$

Percentage shaded = $\frac{77}{294}$ × 100% ≈ 26.19%

26.19% of the rectangle PRSU is shaded.

8.

Fig	1	2	3	4	...	12	99
No. of shaded squares	1	4	9	16	...	12 × 12	99 × 99
No. of unshaded squares	0	1	4	9	...	11 × 11	98 × 98
Total	1	5	13	27	...	265	19405

9.

Items	Quantity	×	Value (legs)	Total
Chicken	3u	×	2	6u
Horses	1u	×	4	4u
Cow	3u + 20	×	4	12u + 80
Total	7u + 20			22u + 80

(a) 8u + 80 = 320

8u = 240

1u = 30

3u = 90

There are **90 chickens** on the ranch.

(b) 90 + 20 = 110

There are **110 cows** on the ranch.

10.

	Fighting Fish	Goldfish
At first	$1u^{\times 7}$	$4u^{\times 2}$
Change	$-5^{\times 7}$	$-25^{\times 2}$
End	$2p^{\times 7}$	$7p^{\times 2}$

	Fighting Fish	Goldfish
At first	7u	8u
Change	–35	–50
End	14p	14p

Goldfish	8u	35
Fighting fish	7u	50

1u = 15

5u – 5 – 25 = 75 – 30 = 45

Melvin has **45 fishes** in the end.

11. D + E + F = 1080

$\frac{1}{2}$ of D + $\frac{1}{2}$ of E + F = 630

$\frac{2}{2}$ of D + $\frac{2}{2}$ of E + 2F = 630 × 2 = 1260

D + E + 2F = 1260

D – D + E – E + 2F – F = 1260 – 1080

F = **180**

E : F

9 : 5

5u = 180

1u = 180 ÷ 5 = 36

Amount of money Ethan received, 9u = 36 × 9 = 324

Amount of money Daniel received

= 1080 – 324 – 180 = 576

Difference between amount of money Daniel and Ethan received = 576 – 324 = 252

Daniel received **$252 more** than Ethan.

12. (a)

Chelsea		x		x		x	} 337
Benny		x					
Amy							

Total = 5u + 4x = 337

Number of paper clips Amy had in terms of x

= (337 – 4x) ÷ 5 = $\frac{337 - 4x}{5}$

(b) 5u = 337 – 12 = 325

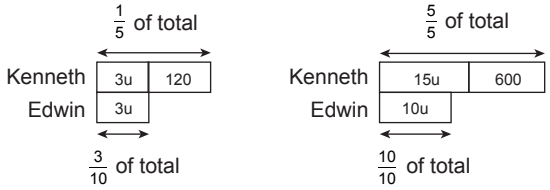
1u = 325 ÷ 5 = 65

4u + 4x = 65 × 4 + 12 = 272

Benny and Chelsea have **272 paper clips** altogether.

13.

<u>At first</u>

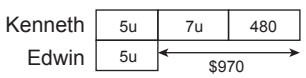


Kenneth spent = $\frac{1}{5}$ × 15u = 3u

= $\frac{1}{5}$ × 600 = 120

Edwin spent = $\frac{1}{2}$ × 10u = 5u

<u>After</u>



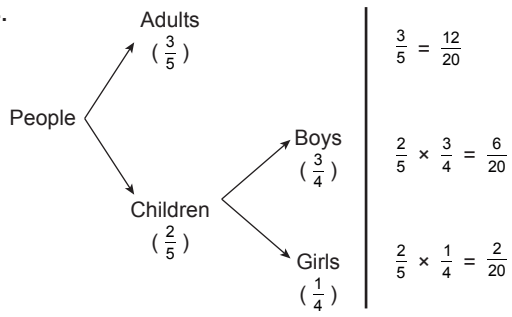
7u = 970 – 480 = 490

1u = 70

15u + 600 = 15 × 70 + 600 = 1650

Kenneth's savings at first was **$1650**.

14.



At first					End		
A	:	B	:	G	:	C	A : C
12	:	6	:	2	:	8	$5^{\times 6}$: $8^{\times 6}$
$6^{\times 5}$	:	$3^{\times 5}$	:	$1^{\times 5}$	:	$4^{\times 5}$	4 : 6
30	:	15	:	5	:	20	30 : 48

30u – 5u = 25u

25u = 150

1u = 6

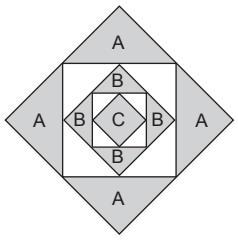
Increase in children

48u – 20u = 28u

28u = 28 × 6 = 168

168 children joined the party.

15.



Area of A = 0.5 × 12 × 24 = 144 cm^2

Area of B = 0.5 × 6 × 12 = 36 cm^2

Area of C = 3 × 6 = 18 cm^2

Total area = 144 + 36 + 18 = **198 cm^2**

16. (a) Water in Tank A = $35 \times 25 \times 66 \times \frac{2}{5}$ = 23 100

Volume with height 4 cm = 35 × 25 × 4 = 3500

Amount transferred to B = 23 100 – 3500 = 19 600

Base area Tank B = 19 600 ÷ 4 = 4900

$\sqrt{4900}$ = 70

Edge of square base is **70 cm**.

(b) Tank B new volume = 19 600 + 73 500 = 93 100

93 100 ÷ 4900 = 19

New height is **19 cm**.

17. (a)

	A	B	C	D
End	$1u^{\times 3}$	$1u^{\times 3}$	$1u^{\times 3}$	$1u^{\times 3}$
	3u	3u	3u	3u
			−1u	+1u
	$3u^{\times 7}$	$3u^{\times 7}$	$2u^{\times 7}$	$4u^{\times 7}$
	21u	21u	14u	28u
		+9u		−9u
	21u	30u	14u	19u
	+15u	−15u	–6	
At first	36u	15u	14u – 6	19u

Total = 36u + 15u + 14u – 6 + 19u = 84u

84u = 330 + 6 = 336

1u = 4

14u – 6 = 14 × 4 – 6 = 50

Basin C had **50 *l*** of water at first.

(b) 3u × 7 = 21u

21 × 4 = 84

C contained 84 *l* of water in the end.

Before D was transferred to C = $84 \times \frac{2}{3}$ = 56 *l*

84 *l* – 56 *l* = 28 *l*

28 *l* of water was transferred from Basin D to Basin C in the end.

Practice Paper 9

1. For every 20 pots sold, he earned $8

= 300 ÷ 20 × 8 = $120

For every 300 pots sold, he earned $20 extra

= 20 + 120 = $140

$724 ÷ $140 = 5 sets of 300 pots remainder $24

5 × 300 = 1500 pots sold

24 ÷ 8 = 3 set of 20 pots

20 × 3 = 60 pots

1500 + 60 = 1560 pots

He must sell **1560 pots**.

2. Old average price = $28

New average price = $35

Difference = $7

Gap = $91 – $35 = $56

No. of calculators at first = 56 ÷ 7 = 8

Calculators bought = 8 + 1 = 9

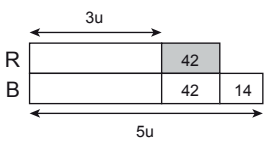
Jane bought **9 calculators**.

3. Area of ABC = $\frac{1}{2} \times 25 \times 12 = 150$ cm^2

Area of ABC also = $\frac{1}{2} \times AB \times 15 = 150$

AB = $\frac{300}{15}$ = **20 cm**

4.



2u = 42 + 14 = 56

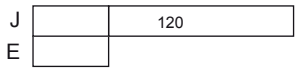
1u = 28

5u – 14 = 5 × 28 – 14 = 126

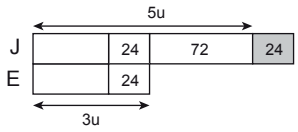
There were **126 blue beads** left in the box.

5.

At first



End



Elaine received = 46 – 22 = 24

2u = 72

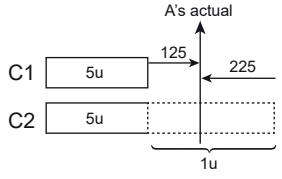
1u = 36

3u = 3 × 36 = 108

Elaine had **108 buttons** in the end.

6.

Case 1 : A → J				Case 2 : J → A			
A	:	J	(Total)	A	:	J	(Total)
$1^{\times 5}$	:	$1^{\times 5}$	$2u^{\times 5}$	$3^{\times 2}$	:	$2^{\times 2}$	$5u^{\times 2}$
5	:	5	10u	6	:	4	10u



(a) 1u = 125 + 225 = 350

5u = 5 × 350 = 1750

C1 : 1750 + 125 = 1875

Albert had **$1875** at first.

(b) C1 : 1750 − 125 = $1625

Joshua had **$1625** at first.

7. **(a)** ∠AJC = 180° – 63° = 117° (int. ∠)

∠HJG = 117° (vert. opp. ∠)

∠JHG = 180° – 117° – 18° = 45° (∠s in a Δ)

∠KHD = 90° – 45° = 45°

∠DHE = 60° – 45° = **15°**

(b) ∠AJH = 63° (Corresponding ∠)

∠JAH = 180° 63° – 45° = 72° (sum of ∠s in a Δ)

∠KAJ = 180° – 72° = **108°** (∠s on a str. line)

8. Affordability = $\frac{80}{360} = \frac{2}{9}$

Hygiene = $\frac{1}{3} = \frac{3}{9}$

Health + Comfort = $1 - \frac{2}{9} - \frac{3}{9} = \frac{4}{9}$

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

Health = $\frac{1}{9}$

$\frac{1}{9}$ Total = 270

$\frac{9}{9}$ Total = 9 × 270 = 2430

There were **2430 people** who took part in the survey.

9. Volume of water in Tank X = 50 × 30 × 12 = 18 000 cm^3

Volume of water in Tank Y = 50 × 24 × 9.75 = 11 700 cm^3

Total Volume = 18 000 cm^3 + 11 700 cm^3 = 29 700 cm^3

Base area of Tank X = 50 × 30 = 1500 cm^2

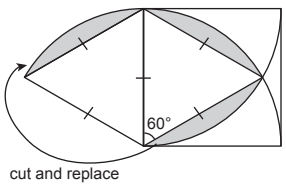
Base area of Tank Y = 50 × 24 = 1200 cm^2

Total base area = 1500 + 1200 = 2700 cm^2

Height of both tanks = 29 700 ÷ 2700 = 11 cm

The height of water level is **11 cm**.

10.



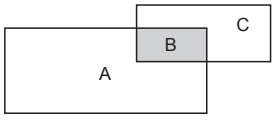
Each figure forms $\frac{1}{3}$ of a circle.

Area of circle = $\frac{22}{7}$ × 7 × 7 = 154 cm^2

The area of the circle is **154 cm^2**.

11.

B + C	:	A + B	B	:	C	:	B + C
7	:	15	4	:	3	:	7



A = 15u − 4u = 11u

Total unshaded = 11u + 3u = 14u

14u = 112

1u = 112 ÷ 14 = 8

15u = 120

The area of the bigger rectangle is 120 cm^2.

L	:	B
6	:	5

$6p \times 5p = 120\ cm^2$

$1p \times 1p = 4\ cm^2$

$1p = 2\ cm$

Length = 6 × 2 cm = 12 cm

The length of the larger rectangle is **12 cm**.

12.

P	T	R	S	
End	$1u^{\times 4}$	$1u^{\times 4}$	$1u^{\times 4}$	$1u^{\times 4}$
4u	4u	4u	4u	
1u				
$4u^{\times 5}$	$4u^{\times 5}$	$4u^{\times 5}$	$5u^{\times 5}$	
20u	20u	20u	25u	
–8u				
20u	20u	12u	25u	
+21	12u	25u		
20u	20u + 21	12u	25u	
–10				
At first	20u – 10	20u + 21	12u	25u

Working Backwards

1 P add 10

2 T gave 21

3 R increase $\frac{2}{3} = \frac{8}{12}$

R now $\frac{5}{3} = \frac{20}{12}$

4 S decrease $\frac{1}{5}$

S now $\frac{4}{5}$

reverse the process

77u = 242 + 10 – 21 = 231

1u = 3

P = 20u – 10 = 50

T = 20u – 21 = 81

R = 12u = 36

S = 25u = 75

Paul, Ted, Roy and Stella weighed **50 kg, 81 kg, 36 kg and 75 kg** respectively.

13. **(a)** Time for the van to travel from Town A to Town B → 5 h

Distance between two towns = 64 × 5 = 320

The two towns were **320 km** apart.

(b) $\frac{3}{4} \times 60\ min = 45\ min$

Time at which the car left Town B,

45 min later → 8.45 a.m.

Time taken for the car to travel from

Town B to Town A → 4 h

Speed of the car = 320 ÷ 4 = 80

The speed of the car was **80 km/h**.

(c) Van travelled from 8 a.m. to 10.30 a.m. → 2.5 h

Distance the van travelled = 2.5 × 64 = 160 km

Car travelled from 10.30 a.m. – 8.45 a.m. → 1.75 h

Distance the car travelled = 1.75 × 80 = 140 km

Distance apart between both vehicles

= 320 − 160 – 140 = 20

The two vehicles were **20 km** apart.

14. Case 1

A	1u		× 5
K	1u	188	× 8

Case 2

A	1u		× 10
K	1u	188	× 6

Total case 1

A = 5u

K = 8u + 1504

Total = 13u + 1504

Total case 2

A = 10u

K = 6u + 1128

Total = 16u + 1128

C1	13u	1504	3674
C2	13u	3u	1128

3u = 1504 + 3674 – 1128 = 4050

1u = 1350

Total at first = 13u + 1504

= 13 × 1350 + 1504 = 19 054

Mr Aw had **$19 054** at first.

15.

	Victoria	Pepe
Case 1: Gave $\frac{2}{3} = \frac{10}{15}$, left $\frac{5}{15}$	5u	5u + 440
Case 2: $\frac{3}{5} = \frac{9}{15}$, left $\frac{6}{15}$	6u	6u + 380

2u = 440 – 380 = 60

1u = 30

Original Amount

Victoria = 15u = 15 × 30 = 450

Total = 10u + 440

= 10 × 30 + 440 = 740

Pepe = 740 – 450 = 290

Percentage Pepe has = $\frac{290}{740} \times 100\% = 39.19\%$

Pepe received **39.19%** of the money.

16. 1 h

A = $\frac{1}{4}$ of a room

B = $\frac{1}{5}$ of a room

C = $\frac{1}{10}$ of a room

$A + B = \frac{1}{4} + \frac{1}{5} = \frac{9}{20}$

$B + C = \frac{1}{5} + \frac{1}{10} = \frac{3}{10}$

In 2 h

A + B = $\frac{9}{20} \times 2 = \frac{18}{20}$ of a room

Fraction of a room unpainted = $\frac{2}{10} = \frac{1}{10}$

Time left to complete the first room

$= \frac{1}{10} \div \frac{3}{10}$

$= \frac{1}{10} \times \frac{10}{3}$

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

2 rooms left to complete B + C

$= 2 \div \frac{3}{10}$

$= \frac{2}{1} \times \frac{10}{3}$

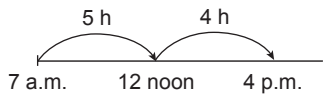
$= \frac{20}{3}$ h

Total time taken to paint all 3 rooms

$= 2 \text{ h} + \frac{1}{3} \text{ h} + \frac{20}{3} \text{ h}$

$= 2 \text{ h} + 7 \text{ h}$

$= 9 \text{ h}$



Ben and Carl would finish painting at **4 p.m.**

17. (a) 2 S + 3 R = $3.90

3 S + 4 R = $5.60

6 S + 9 R = $11.70

6 S + 8 R = $11.20

1 R = $0.50

The ruler cost **$0.50**.

(b) 2S = 3.90 − 3 R

= 3.90 − 3 × 0.50 = 2.40

1S = 1.20

Item	Qty	×	Value ($)	Total Value
Staplers	4u	×	1.20	4.8u
Rulers	5u	×	0.50	2.5u
Total	9u			7.3u

7.3u = 167.90

1u = 23

5u = 5 × 23 = 115

Delroy bought **115 rulers**.

Practice Paper 10

1.

Case 1			Case 2		
June	:	July	July	:	August
10	:	12	100	:	70
5	:	6	10	:	7
25	:	30	30	:	21

June	:	July	:	August
25	:	30	:	21

25u – 21u = 4u

4u = 8000

1u = 2000

Total = 25u + 30u + 21u = 76u

76u = 76 × 2000 = 152 000

Total amount collected in 3 months was **$152 000**.

2.

Now	3x years' time
Jane = $2x$	Jane = $5x + 2$
Sister = $2x - 3$	Sister = $5x - 1$

Total = $10x + 1$

Their total age is **($10x + 1$) years**.

3. (a) True

Area of DEF = $\frac{1}{2}$ × 8 units × 11 units

Area of ABC = $\frac{1}{2}$ × 8 units × 10 units

(b) True

Line DE is longer than Line AC as DE spans from the corners of a 11 × 11 square while AC spans from the corners of an 8 × 10 rectangle. DF is also longer than 10 units since the perpendicular height is already 11 units.

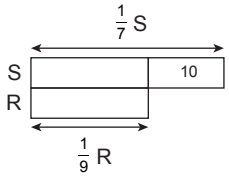
Hence, the perimeter of triangle DEF (8 units + DF + DE) is longer than the perimeter of triangle ABC (8 units + 10 units + AC).

4. Keith's Speed = 240 ÷ 2 = 120 m/min

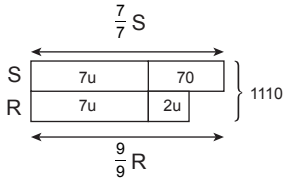
Time taken for Keith = 1500 ÷ 120 = $12\frac{1}{2}$ min

Keith took **$12\frac{1}{2}$ min** to travel from the park to the supermarket.

5.



At first



16u = 1110 − 70 = 1040

1u = 1040 ÷ 16 = 65

7u + 70 = 7 × 65 + 70 = 525

Sarah baked **525 muffins**.

6. Area of square = 5u × 5u

25 × (1u × 1u) = 625 cm^2

Length

Square	:	Rectangle
5	:	7

(1u × 1u) = 625 ÷ 25 = 25 cm^2

1u = 5 cm

Length of rectangle 7u = 7 × 5 = 35

Breadth of rectangle 5u = 5 × 5 = 25

Area of rectangle = 35 × 25 = **875 cm^2**

7. Speed of car = 5u/h

Speed of bus = 4u/h

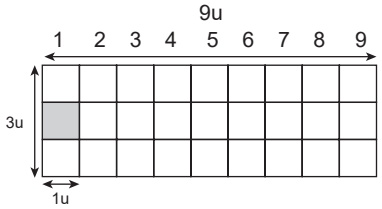
Distance bus was ahead = 4u/h × $\frac{1}{2}$ h = 2u

Difference in speed 5u/h – 4u/h = 1u/h

Time to catch up = $\frac{2u}{1u/h}$ = 2 h

The car caught up at **20 18**.

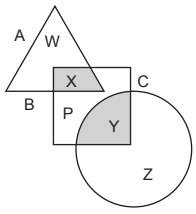
8.



Total number of square = 9 × 3 = 27

Fraction of rectangle not occupied = $\frac{27-1}{27}$ = **$\frac{26}{27}$**

9. Label the shaded part of triangle as X and shaded part of circle as Y.



W+X	:	X+P+Y	:	Y+Z
$3^{\times 5}$	:	$4^{\times 5}$	:	$5^{\times 5}$
15	:	20	:	25

X	:	W		W+X
$1^{\times 3}$	:	$4^{\times 3}$	:	$5^{\times 3}$
3	:	12	:	15

Y	:	Z		Y+Z
$1^{\times 5}$	:	$4^{\times 5}$	:	$5^{\times 5}$
5	:	20	:	25

Summary

X	:	W	:	P	:	Y	:	Z
3	:	12	:	12	:	5	:	20

P = 20u – 5u – 3u = 12u

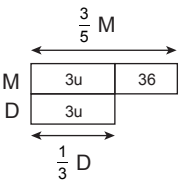
Area of total unshaded

= W + Z + P = 12 + 12 + 20 = 44u

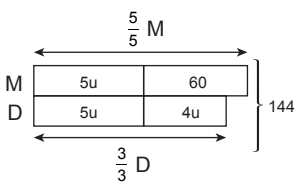
Area of total shaded = Y + X = 5 + 3 = 8u

Ratio of shaded to unshaded figure = 8 : 44 = **2 : 11**

10. In the end



At first



14u = 144 – 60 = 84

14u = 84

1u = 6

6u + 36 = 6 × 6 + 36 = 72

There were **72 fruits** in the end.

11. A = 440 – 40 = 400

A in Business Class = $\frac{400 - 180}{2}$ = 100

A in Economy Class = 110 + 80 = 290

	W	M
Business	$\frac{1}{5}$	$\frac{7}{20}$
Economy	$\frac{4}{5}$	$\frac{13}{20}$

$\frac{1}{5}$ W + $\frac{7}{20}$ M = 110... (1)$^{\times 4}$

$\frac{4}{5}$ W + $\frac{13}{20}$ M = 290... (2)

$\frac{4}{5}$ W + $\frac{28}{20}$ M = 440... (3)

(3 – 2)

$\frac{15}{20}$ M = 440 – 290 = 150

$\frac{1}{20}$ M = 10

$\frac{20}{20}$ M = 20 × 10 = 200

400 – 200 = 200

There were **200 women** on board the plane.

12. $\frac{3}{4}$ J = $\frac{4}{7}$ K

$\frac{12}{16}$ J = $\frac{12}{21}$ K

J : K

16 : 21

Jamie: $1^{\times 4}$: $3^{\times 4}$ (Total) $4u^{\times 4}$

4 : 12 16u

Kate: $4^{\times 3}$: $3^{\times 3}$ (Total) $7u^{\times 3}$

12 : 9 21u

Items	Quantity	×	Value ($)	Total Value ($)
$1 (J)	4u	×	1	4u
50¢ (J)	12u	×	0.5	6u
$1 (K)	12u	×	1	12u
50¢ (K)	9u	×	0.5	4.5u
Total	37u			26.5u

26.5u = 132.50

1u = 5

10u = 50

Jamie has **$50**.

13. $\frac{4}{5}$ W = $\frac{3}{10}$ M × 3

$\frac{4}{5}$ W = $\frac{9}{10}$ M

$\frac{36}{45}$ W = $\frac{36}{40}$ M

W : M (Women to Men at first)

45 : 40

Men who remained = $\frac{36}{3}$ = 12u

Children at the fund-raising = 12u × 2 = 24u

Ratio of men to women to children who remained **1 : 3 : 2**.

14. HX : XC

3 : 1

4u = 8 cm

1u = 2 cm

Draw a straight line from pt x to ED to form Z. Area of

Triangle BFD = $\frac{1}{2}$ × 16 × 20 = 160 cm^2

Area of triangle BCX = $\frac{1}{2}$ × 2 × 12 = 12 cm^2

Area of triangle XFZ = $\frac{1}{2}$ × 14 × 8 = 56 cm^2

Area of Rectangle XZCD = 8 × 2 = 16 cm^2

Area of shaded triangle = 160 – 12 – 56 – 16 = **76 cm**^{2}

15. Left

10-cent coins = $\frac{2}{5}$ = $\frac{6}{15}$

20-cent coins = $\frac{3}{4}$ = $\frac{6}{8}$

50-cent coins = $\frac{2}{5}$

Coins left

10-cent : 20-cent 50-cent : 10-cent + 20 cent

6 : 6 2 : 3

8 : 12

10 cent : 20-cent : 50-cent

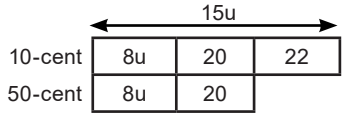
6 : 6 : 8

(a) Spent At first

10-cent coins = $\frac{3}{5}$ = $\frac{9}{15}$ 10-cent coins = 15u

20-cent coins = $\frac{1}{4}$ = $\frac{2}{8}$ 20-cent coins = 8u

50-cent coins = 20 coins 50-cent coins = 8u + 20 coins



No. of 10-cent coins = 8u + 20 + 22 = 15u

7u = 42

1u = 6

15u = 15 × 6 = 90

Kelly had **90 10-cent coins** at first.

(b) 9 × 6 × $0.10 = $5.40

2 × 6 × $0.20 = $2.40

20 × $0.50 = $10

Total = $5.40 + $2.40 + $10 = $17.80

Kelly spent **$17.80** in all.

16. (a) Total boys excess = 26 × (238 – 220)

= 468

Each girl's shortage = 220 – 181

= 39

No. of girls = 468 ÷ 39

= **12**

(b) Total (At first) = 38 × 220

= 8360

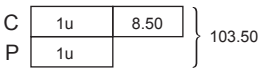
Total (End) = 39 × 222

= 8658

Regina = 8658 – 8360

= **298**

17.



2u = 103.50 – 8.50 = 95

P = 1u = 95 ÷ 2 = 47.50

C = 47.5 + 8.5 = 56

Items	Quantity	×	Value (cents)	Total (cents)
Coloured	8u	×		5600
Plain	5u	×		4750
Total	13u			10 350

8u of coloured crepe paper costs 5600 cents

1u of coloured crepe paper cost 700 cents

5u of plain crepe paper costs 4750 cents

1u of plain crepe paper cost 950 cents

Difference between 1u of coloured and 1u of plain crepe papers = 950 cents – 700 cents = 250 cents

Difference between 1 coloured and 1 plain crepe paper = 50 cents

1u = 250 cents ÷ 50 cents = 5

(a) 5u = 5 × 5 = 25

She bought **25 rolls of plain crepe paper**.

(b) 8u = 8 × 5 = 40

Cost of 1 roll of coloured crepe paper = 5600 ÷ 40

= 1.40

Each roll of coloured crepe paper cost **$1.40**.

Bonus Questions

1. Ivan

15 30 h – 10 30 h = 5 h

Distance travelled by 3.30 p.m. = 72 km/h × 5 h

= 360 km

Joshua at 3.30 p.m.

Distance = 360 km; Time taken = 4 h;

Speed = 360 km ÷ 4 = 90 km/h

Time taken for Ivan to complete the remaining 144 km

144 km ÷ 72 km/h = 2 h

Time taken for Joshua to complete the remaining 144 km

144 km ÷ 90 km/h = 1.6 h

2 h – 1.6 h = 0.4 h = 24 min

Ivan completed the whole journey **24 min** earlier than Joshua.

2. (a) False

Total number of males = 102 + 78 + 42 + 48

= 270

Total number of females = 42 + 60 + 96 + 12

= 210

Total number of people = 270 + 210

= 480

Males : Total

270 : 480

9 : 16

(b) True

Average number of people over 4 months = 480 ÷ 4

= 120

3.

Items	Qty	×	Value ($)	Total ($)
$72-ticket	9u	×	72	648u
$156-ticket	4u	×	156	624u
$200-ticket	3u	×	200	600u
Total	16u			1872u

Difference = 648 – 624u = 24u

24u = 36 312

1u = 36 312 ÷ 24 = 1513

1872u = 1872 × 1513 = 2 832 336

The total amount of money collected from the sale of all the tickets was **$2 832 336**.

4.

A	:	S+C	S	:	C	(Total)
1	:	10	$1^{\times 2}$	:	$4^{\times 2}$	$5u^{\times 2}$
			2	:	8	10u

At first	A	:	S	:	C	(Total)
	$1^{\times 3}$	:	$2^{\times 3}$	:	$8^{\times 3}$	$11u^{\times 3}$
	3	:	6	:	24	33u

End	A	:	S	:	C	(Total)
	1	:	1	:	1	$3u^{\times 11}$
	11	:	11	:	11	33u

13u = 78

1u = 6

33u = 198

There were **198 cards** at first.

5. **(a)** $\frac{3}{4}$ of money = 4C + 4P

Since 2P = 1C

Hence, 4P = 2C

$\frac{3}{4}$ of money = 4C + 2C = 6C

$\frac{1}{4}$ of money = 2C

Duane could buy another **2 bars of chocolate** with his remaining money.

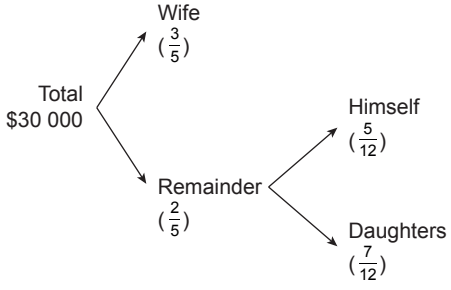
(b) $\frac{4}{4}$ of money = 4 × 2 = 8 bars of chocolate

1 bar of chocolate = 2 × 1.50 = $3

8 bars of chocolate = 8 × 3 = $24

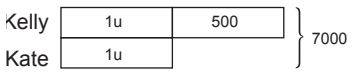
Duane received **$24**.

6.



Remainder = $\frac{2}{5}$ × 30 000 = 12 000

Daughters = $\frac{7}{12}$ × 12 000 = 7000



2u = 7000 – 500 = 6500

1u = 6500 ÷ 2 = 3250

Kelly = 1u + 500 = 3250 + 500 = 3750

Kelly received **$3750**.

7. Case 1

C $\overset{\$10}{=}$ B

C	:	B	(Total)
$1^{\times 3}$	:	$1^{\times 3}$	$2u^{\times 3}$
3	:	3	6u

Case 2

B $\overset{\$20}{=}$ C

C	:	B	(Total)
$1^{\times 2}$	:	$2^{\times 2}$	$3u^{\times 2}$
2	:	4	6u

(a) 1u = 10 + 20 = $30

Using C1, Ben = 3u – 10

= 90 – 10 = 80

Ben has **$80**.

(b) Using C1, Collin = 3u + 10

= 90 + 10 = 100

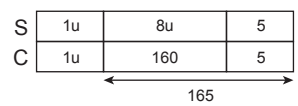
Collin has **$100**.

8.

	S	C
At first	$3u^{\times 3}$	1u
Change	$-55^{\times 3}$	–5
End	$1p^{\times 3}$	3p

(Working)

S	C
9u	1u
–165	–5
3p	3p



8u = 165 – 5 = 160

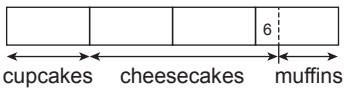
1u = 160 ÷ 8 = 20

3u = 3 × 20 = 60

No. of sweets in the end = 60 – 55 = 5

Judith has **5 sweets** in the end.

9.



Cupcakes = 25% of total = $\frac{1}{4}$ of Total

Cheesecakes = $\frac{2}{4}$ of Total + 6

Muffins = $\frac{1}{4}$ of Total – 6

Items	Qty	×	Value ($)	Total ($)
Cupcakes	1u	×	2.10	2.10u
Cheesecakes	2u + 6	×	4.05	8.10u + 24.30
Muffins	1u – 6	×	1.60	1.60 – 9.60
Total	4u			11.8u + 14.70

Total spent = 11.8u + 14.70 = 262.50

11.8u = 247.8

1u = 247.8 ÷ 11.8 = 21

2u + 6 = 2 × 21 + 6 = 48

Eunice bought **48 cheesecakes** altogether.

10. Area of big square = 17 × 17 = 289 cm^2

Area of 1Δ = 289 – 229 = 60 cm^2

Base area of 1Δ = $\frac{60 \times 2}{15}$ = 8 cm

Length of smaller square = 15 – 8 = 7 cm

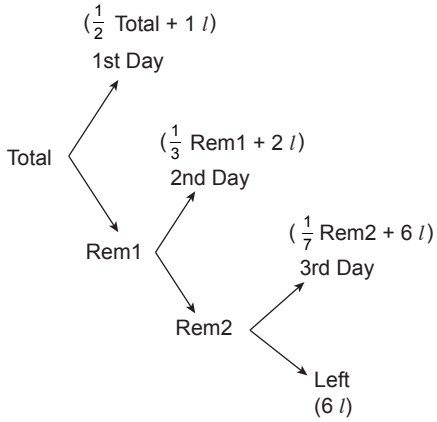
Area of square = 7 × 7 = 49 cm^2

Area of circle = $\frac{22}{7} \times \frac{7}{2} \times \frac{7}{2}$ = 38.5 cm^2

Area of shaded part = 49 – 38.5 = 10.5 cm^2

The area of the shaded part is **10.5 cm**^{2}.

11.



Rem2

$\frac{6}{7}$ Rem2 = 6 l + 6 l = 12 l

$\frac{1}{7}$ Rem2 = 12 l ÷ 6 = 2 l

$\frac{7}{7}$ Rem2 = 2 l × 7 = 14 l

Rem1

$\frac{2}{3}$ Rem1 = 14 l + 2 l = 16 l

$\frac{1}{3}$ Rem1 = 16 l ÷ 2 = 8 l

$\frac{3}{3}$ Rem1 = 8 l × 3 = 24 l

Total

$\frac{1}{2}$ Total = 24 l + 1 l = 25 l

$\frac{2}{2}$ Total = 25 l × 2 = 50 l

There were **50 l** of lemonade in the container at first.

12. Area of all rectangles

= (10 × 2) + (5 × 15) + (8 × 20) + (12 × 9)

= 20 + 75 + 160 + 108

= 363 cm^2

Area of unshaded triangles

= ($\frac{1}{2}$ × 10 × 2) + ($\frac{1}{2}$ × 8 × 15) + ($\frac{1}{2}$ × 9 × 12)

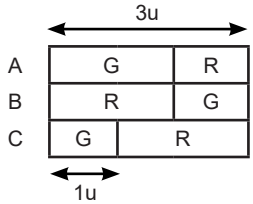
+ ($\frac{1}{2}$ × 12 × 8)

= 10 + 60 + 54 + 48 = 172

= 172 cm^2

Shaded area = 363 – 172 = **191 cm**^{2}

13.



(a) Green = 3u + 1u = 4u

Red = 3u + 2u = 5u

Ratio G : R is **4 : 5**

(b) 3u = 45

1u = 45 ÷ 3

= 15

4u = 4 × 15

= 60

There were **60 green apples** in the basket.

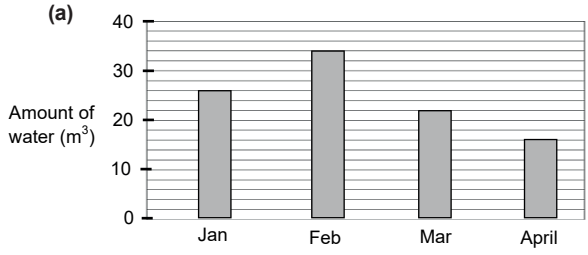
14. Total amount of water used (m^3) = $235.20 ÷ $2.40

= 98

Amount of water used in April (m^3) = 98 – 26 – 34 – 22

= 16

(a)



(b) (i) Not possible to tell

There is not enough evidence to show that the Lee family spent the most amount of time at home in February. For example, the Lee family could have spent the most amount of time at home in other months but used less water.

(b) (ii) True

Most water usage = February

Least water usage = April

Difference in water usage = 34 m^3 – 16 m^3

= 18 m^3

15. June

Zen	10u	500
Cherry	10u	

Change in Zen

$\frac{1}{5}$ × 10u = 2u

$\frac{1}{5}$ × 500 = 100

Change in Cherry

$\frac{1}{10}$ × 10u = 1u

Zen	9u	3u	600	} 3204
Cherry	9u			

21u + 600 = 3204

21u = 3204 – 600 = 2604

1u = 124

No. of Zen computers in June = 10 × 124 + 500 = 1740

There were **1740** Zen computers in June.

16.

Gold	Silver	Bronze	Total	Check
25 × 5 = 125	0 × 2 = 0	0 × 1 = 0	125 –11	✗
22 × 5 = 110	1 × 2 = 2	2 × 1 = 2	114 –11	✗
19 × 5 = 95	2 × 2 = 4	4 × 1 = 4	103	✗
4 × 5 = 20	7 × 2 = 14	14 × 1 = 14	77	✓

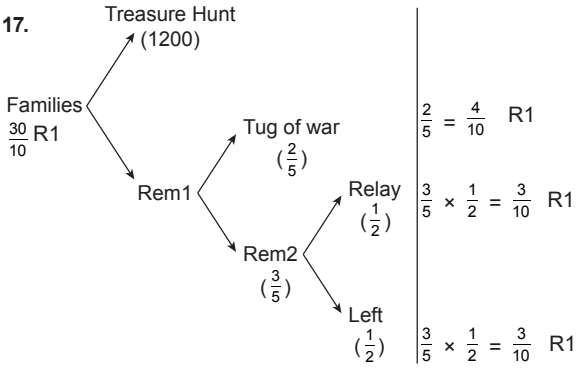
Target difference = 125 – 48 = 77 points

No. of silver medals = 77 ÷ 11 = 7

No. of gold meals = 25 – 21 = 4

BGS won **4 Gold medals**.

17.



Left = $\frac{1}{10}$ Total families

$\frac{3}{10}$ Rem1 = $\frac{1}{10}$ Total

$\frac{30}{10}$ Rem1 = $\frac{10}{10}$ Total

Treasure Hunt = $\frac{30}{10}$ Rem1 – $\frac{10}{10}$ Rem1

= $\frac{20}{10}$ Rem1

20u = 1200

1u = 60

30u = 1800

There were **1800 families**.

18. (a) Figure 10 = $\frac{10}{2}$ × (10 + 1) = 55

Figure 6 = $\frac{6}{2}$ × 7 = 21

Number of triangles = 55 – 12 = **34**

(b) $\frac{n}{2}$ × (n + 1) = 171

n × (n + 1) = 342

n = **18**

(c) No. of grey triangles = (48 + 1) × $\frac{48}{2}$ = 1176

No. of white triangles needed = (46 + 1) × $\frac{46}{2}$ = 1081

No. of additional white triangles needed

= 1081 – 16 = 1065

Total no. of grey triangles = 1065 + 1176

= **2241 grey triangles**

19.

Length				Area			
C	:	Inner	: outer	C	:	Inner	: outer
Circumference							
1	:	7	: 9	1^2	:	7^2	: 9^2
				1	:	49	: 81

Area of shaded region = 81u – 4u – 49u = 28 units

1 unit = 87.92 ÷ 28 = 3.14 cm^2

Area of small circle = 3.14 × r × r = 3.14 cm^2

r × r = 1 cm^2

r = 1 cm

Circumference of small circle = 3.14 × 2 × 1 = 6.28 cm

1u = 6.28 cm

Total perimeter of circle = 4u + 7u + 9u = 20u

= 20u = 20 × 6.28 = **125.6 cm**

20. ∠GBP = 180° – 68° = 112°

∠GBO = 112° ÷ 2 = 56°

∠ABG = 180° – 56° = 124°

$\angle x = \frac{180 - 24}{2} = 28°$

∠FGO = 68° – 23° = 45°

∠GFD = 180° – 56° = 112° (int. ∠s)

∠GDF = 180° – 45° – 112° = 23° (sum of ∠s in a Δ)

∠DFE = 23° (alt. ∠s)

$\angle y$ = 180° – 34° – 23° = **123°**

21. **(a)** Figure 1 = 1^2 × 2 + 2 = 4

Figure 2 = 2^2 × 2 + 3 = 11

Figure 3 = 3^2 × 2 + 4 = 22

Figure 5 = 5^2 × 2 + 6 = **56**

(b) Figure 20 = 20^2 × 2 + 21 = **821**

(c) By trial and error

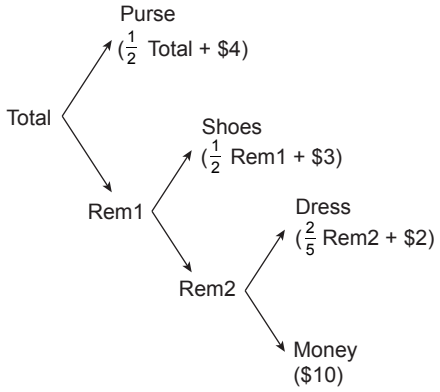
25^2 × 2 + 26 = 1276

30^2 × 2 + 31 = 1831

31^2 × 2 + 32 = 1954

There are 1954 dots in **Figure 31**.

22.



Left

$\frac{3}{5}$ Left – 2 = $10

$\frac{3}{5}$ Left = $12

$\frac{1}{5}$ Left = $4

$\frac{5}{5}$ Left = $20

Remaining

$\frac{1}{2}$ Rem – 3 = $20

$\frac{1}{2}$ Rem = $23

$\frac{2}{2}$ Rem = $46

Total

$\frac{1}{2}$ Total – 4 = $46

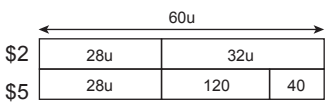
$\frac{1}{2}$ Total = $50

$\frac{2}{2}$ Total = $100

She had **$100** at first.

23.

	$2	$5
At first	12u	7u
Change	–24	+10
End	4p	5p
Working	$2	$5
	60u	28u
	–120	+40
	20p	20p



32u = 160

1u = 5

Total $2-notes at first = 12u = 12 × 5 = 60

Value of $2-notes = 60 × 2 = 120

The total value of $2-notes Delroy had at first was **$120**.

24. Area of shaded part UVXW = $\frac{1}{8}$ of OUX – $\frac{1}{8}$ of OVW

$= \frac{1}{8} \times \pi \times 30 \times 30 - \frac{1}{8} \times \pi \times 20 \times 20 = 196.43 \text{ cm}^2$

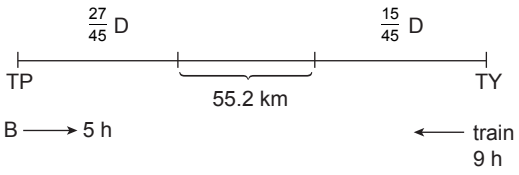
Area of shaded triangle = $\frac{1}{2} \times 39 \times 40 = 780 \text{ cm}^2$

Total shaded area = 780 cm^2 + 196.43 cm^2

= **976.43 cm^2**

The total area of the shaded parts is **976.43 cm^2**.

25.



Distance travelled per hour by the bullet train = $\frac{1}{5}$

Distance travelled per hour by the electric train = $\frac{1}{9}$

After 3 hours

Bullet train = $\frac{1}{5} \times 3 = \frac{3}{5}$ distance

Electric train = $\frac{1}{9} \times 3 = \frac{3}{9}$ distance

$1 - \frac{3}{5} - \frac{3}{9} = \frac{45}{45} - \frac{27}{45} - \frac{15}{45} = \frac{3}{45}$

$\frac{3}{45}$ D = 55.2 km

$\frac{45}{45}$ D = 828 km

Speed of electric train = 828 ÷ 9 = 92

The speed of the electric train was **92 km/h**.

26. $\frac{1}{3}$ K = $\frac{2}{5}$ J

$\frac{2}{6}$ K = $\frac{2}{5}$ J

K : J

6 : 5

$\frac{1}{2}$ J = $\frac{1}{3}$ R

J : R

2 : 3

K	:	J	J	:	R
$6^{\times 2}$	:	$5^{\times 2}$	$2^{\times 5}$	:	$3^{\times 5}$
12	:	10	10	:	15

K	:	J	:	R
12	:	10	:	15

15u = 150

1u = 10

3u = 30

The difference is **50 stickers**.

27. Area of rectangle = 12 × 5 = 60 cm^2

Area of circle = 3.14 × 6.5 × 6.5 = 132.665 cm^2

Area of shaded part = 132.665 – 60 = 72.665 cm^2

Area of 2 small semicircles = 3.14 × 2.5 × 2.5

= 19.625 cm^2

Area of 2 medium semicircles = 3.14 × 6 × 6

= 113.04 cm^2

Area of unshaded part = 113.04 + 19.625 + 60 – 72.665

= 120 cm^2

The area of the unshaded part is **120 cm^2**.

28.

End	At first
F : T	F : T
5 : 8	15 : 8

$\frac{2}{3}$ F + $\frac{1}{4}$ B = 120 (Went home)

$\frac{8}{3}$ F + B = 480 (× 4)

T = $\frac{8}{15}$ F

F + $\frac{8}{15}$ F + B = 310 (Replace T with $\frac{8}{15}$ F)

$\frac{23}{15}$ F + B = 310… (a)

$\frac{40}{15}$ F + B = 480… (b)

$\frac{17}{15}$ F = 170… (b) – (a)

$\frac{1}{15}$ F = 10

$\frac{10}{15}$ F = 100

100 Football players went home.

29. Sum of consecutive pairs (numerator)

= Sum of 3 to 25

$= (25 + 3) \times \frac{25 - 1}{4} = 168$

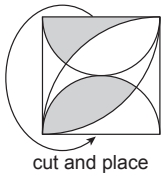
Sum of consecutive pairs (denominator)

= Sum of 40 to 380

$= 20 \times \frac{19}{2} \times 20 - 20 = 3780$

Value = 168 ÷ 3780 = $\frac{2}{45}$

30.

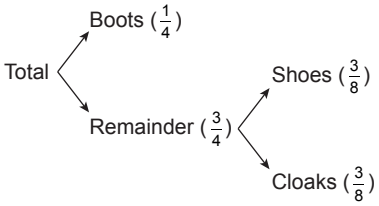


Diameter = $\sqrt{196}$ = 14 cm

Radius = 7 cm

Area of semi-circle = $\frac{1}{2} \times \frac{22}{7} \times 7 \times 7$ = **77 cm²**

31.



At first				End			
B	:	S	: C	B	:	S	: C
$2^{\times 3}$	:	$3^{\times 3}$	: $3^{\times 3}$	3	:	4	: 5
6	:	9	: 9				

Item	Quantity	×	Value $	Total
B	3u	×	40	120u
S	4u	×	20	80u
C	5u	×	15	75u
Total	12u			275u

275u = 2200

1u = 2200 ÷ 275 = 8

9u = 9 × 8 = 72

Gary had **72 cloaks** in stock.

32.

	C	D
End	$20^{\times 3}$	80
Change	$+3u^{\times 3}$	+4u
At first	$1p^{\times 3}$	3p

	C	D
End	60	80
Change	+9u	+4u
At first	3p	3p

C	9u	60	(9u + 60)
D	4u	80	(4u + 80)

5u = 20

1u = 20 ÷ 5 = 4

3u = 3 × 4 = 12

Catherine lost **12 marbles**.

33.

C	9u	81	} 348.30
S	9u		

At first

C	10u	90
S	10u	

18u + 81 = 348.30

18u = 267.30

1u = 14.85

Original price = 14.85 × 10 + 90 = 238.50

The original price of the Castle and Dungeon Adventure set is **$238.50**.

34. (a) Area of ΔAGH = $\frac{1}{4} \times 144$ = 36 cm²

Area of BCFG = 36 cm × 2 = 72 cm²

Area of ΔDEI = $\frac{1}{2} \times 72$ = 36 cm²

Area of ΔGCI = $\frac{1}{2} \times 36$ = 18 cm²

Total area of shaded part = 36 + 36 + 18

= **90 cm²**

(b) Area of figure = 36 × 7 = 252 cm²

Fraction of unshaded figure = $\frac{252 - 90}{252} = \frac{\mathbf{9}}{\mathbf{14}}$

35.

Items	Value	×	No. of boxes	Total Donuts
small	1u	×	12	12u
big	1u + 21	×	5	5u + 105
Total	2u + 21			17u + 105

Fraction of donuts in big boxes = $\frac{12}{30} = \frac{2}{5}$

Small box = $\frac{3}{5}$ Total = 12u

$\frac{1}{5}$ Total = 4u

Big box = $\frac{2}{5}$ Total = 2 × 4u = 8u

8u	
5u	105

3u = 105

1u = 35

Each small box contained **35 donuts**.

36. Volume of water in Tank A (10 minutes) = 10 × 1080 cm³

= 10 800 cm³

Height of Tank A (10 minutes)

= 10 800 cm³ ÷ (30 cm × 24 cm)

= 15 cm

Height increase of Tank A (1 minute)

= 15 cm ÷ 10

= 1.5 cm

Height increase of Tank B (1 minute)

= 900 cm^3 ÷ (20 cm × 18 cm)

= 2.5 cm

Height catch-up by Tank B every minute

= 2.5 cm – 1.5 cm

= 1 cm

No. of minutes for Tank B to catch-up with Tank A

= 15 cm ÷ 1 cm

= 15

Height of water level of Tank B (15 minutes)

= 15 × 2.5 cm

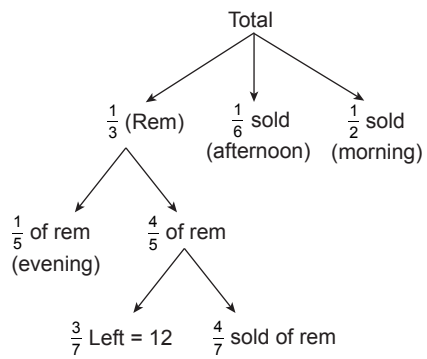
= **37.5 cm**

37. ∠BFC = 21° (corresponding angles with ∠ABF)

∠FCE = 21° (corresponding angles with ∠BFC)

∠FEC = 180° – 21° – 30°= **129°** (sum of ∠s in a △)

38.



$\frac{3}{7}$ Left = 12

$\frac{1}{7}$ Left = 12 ÷ 3 = 4

$\frac{7}{7}$ Left = 7 × 4 = 28

$\frac{4}{5}$ of Rem = 28

$\frac{1}{5}$ of Rem = 7

$\frac{5}{5}$ of Rem = 35

$\frac{1}{3}$ of Total = 35

$\frac{3}{3}$ of Total = 105

Winnie baked **105 muffins** at first.

39. $\frac{4}{5}$ M = $\frac{3}{7}$ W × 2

$\frac{4}{5}$ M = $\frac{6}{7}$ W × 2

$\frac{12}{15}$ M = $\frac{12}{14}$ W × 2

(a) M : W

15 : 14

The ratio of the number of men to the number of women in the queue at first was **15 : 14**.

(b)

	M	W
At first	15u	14u
Change	+25	–7
End	2p	1p

(Working)

	M	W
	15u	$14u^{\times 2}$
	+25	$-7^{\times 2}$
	2p	$1p^{\times 2}$

M	15u	25	14
W	15u	13u	

13u = 39

1u = 3

W (at first) = 14 × 3 = 42

W (end) = 42 – 7 = 35

There were **35 women** in the queue in the end.

40. 1. Common Distance

	Caleb	:	Jack
Ratio of time	4	:	5
Ratio of speed	5	:	4

2. Common Time

	Caleb	:	Jack
Ratio of speed	5	:	4
Ratio of distance	5	:	4

1u = 25 × 2 = 50 km

Total distance : 9u = 450

Caleb's speed = 450 ÷ 4 = 112.5

The distance between Town A and Town B was **450 km** and Caleb's speed was **112.5 km/h**.

41. **(a)** Figure 1 → 1 × 1 + 5 = 6

Figure 2 → 2 × 2 + 5 = 9

Figure 3 → 3 × 3 + 5 = 14

Figure 35 → 35 × 35 + 5 = **1230**

(b) No. of straight lines = 358

Figure no. = 358 – 3 = 355

355 ÷ 5 = 71

No. of circles = 71 × 71 + 5 = **5046**

42. Left = 1 – $\frac{3}{5}$ = $\frac{2}{5}$

$\frac{2}{5}$ of Total = $\frac{2}{5}$ × 3780 = 1512

After transfer				End			
J	:	K	Total	J	:	K	Total
$5^{\times 7}$	:	$7^{\times 7}$	$12u^{\times 7}$	$4^{\times 12}$	:	$3^{\times 12}$	$7u^{\times 12}$
35	:	49	84u	48	:	36	84u

Jovan + Kate in the end = 84u

84u = 1512

1u = 1512 ÷ 84 = 18

Amount given such that Kate has 75% of Jovan

= 49u − 36u = 13u

13u = 13 × 18 = 234

Kate must give Jovan **$234**.

43. (a) 20% of height = $\frac{1}{5}$ × 210 = 42 cm

Change in height = 100 – 42 = 58 cm

Volume of 10 buckets = 100 × 140 × 58

= 812 000 cm^3

Volume of 1 bucket = **81 200 cm^3**

(b) Volume of water = 100 × 140 × 100

= 1400 000 cm^3 = 1400 *l*

Time take = 1400 ÷ 25 = 56

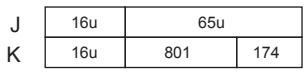
It would take **56 minutes** to drain the water completely.

44. $\frac{2}{3}J = \frac{3}{4}K$

$\frac{6}{9}J = \frac{6}{8}K$

Items	J	K
At first	$9u^{\times 9}$	$8u^{\times 2}$
Change	$-89^{\times 9}$	$+81^{\times 2}$
End	$2p^{\times 9}$	$9p^{\times 2}$

J	K
81u	16u
−801	+174
18p	18p



65u = 975

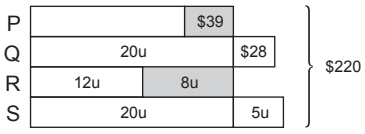
1u = 15

J = 9u = 135

K = 8u = 120

Kimberly had **$120** and Jennifer had **$135**.

45. End



S = 25u

R = 12u

Q = 20u + $28

P = 20u – $39

$220

77u = 231

1u = 3

At first

S = 25 × 3 = 75

R = 12 × 3 = 36

Q = 88

P = 21

Priya, Qistine, Rainer and Suzy had **$21**, **$88**, **$36** and **$75** respectively at first.

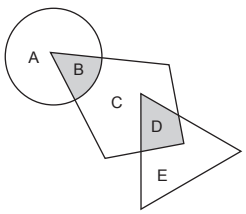
46. Circle = A + B

Kite = B + C + D

Triangle = D + E

Unshaded = A + C + E

Figure = A + B + C + D + E



A+B	:	B+C+D	B	:	A+B	C	:	B+D	(B+C+D)
$3^{\times 4}$	:	$5^{\times 4}$	$1^{\times 3}$	:	$4^{\times 3}$	$1^{\times 10}$	:	$1^{\times 10}$	$2^{\times 10}$
12	:	20	3	:	12	10	:	10	20

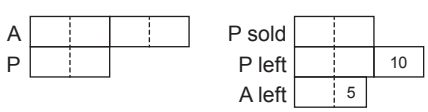
A	:	B	:	C	:	D	D	:	E
$9^{\times 2}$	:	$3^{\times 2}$	:	$10^{\times 2}$	:	$7^{\times 2}$	$2^{\times 7}$	:	$3^{\times 7}$
18	:	6	:	20	:	14	14	:	21

Unshaded = A + C + E = 59u

Fig = A + B + C + D + E = 79u

Unshaded percentage = $\frac{59}{79}$ × 100% ≈ **74.7%**

47. Sold



A sold = 4u

P sold = 2u

P left = 2u + 10

A left = 1u + 5

Total = 4u + 2u + 2u + 1u + 10 + 5 = 9u + 15 = 159

9u = 159 – 15 = 144

1u = 144 ÷ 9 = 16

2u = 2 × 16 = 32

4u = 2 × 32 = 64

Mr Ong sold **64 apples** and **32 apples**.

48.

Case 1

K	2u	2u	2u
J	2u	400	

Case 2

K	1p = 1u + 200	100
J	1p = 1u + 200	1p = 1u + 200

2p = 2u + 400

1p = 1u + 200

6u = 1u + 200 + 100

5u = 300

1u = 60

6u = 6 × 60 = 360

Kathy has **$360**.

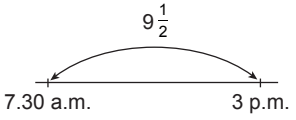
49. (a) Speed of Marcus = 120 km ÷ $1\frac{1}{2}$ = 80 km/h

Distance = 720 – 120 = 600

Time taken = 600 ÷ 80 = 7.5 h

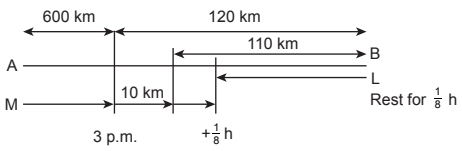
Speed of Leo = 720 ÷ 7.5 = 96 km/h

SL = 96 km/h SM = 80 km/h



They left at **7.30 a.m.**

(b)



Distance M travelled while Leo rested

= 80 km/h × $\frac{1}{8}$ h

= 10 km

Distance between M and L = 120 – 10 = 110 km

Speed			Distance		
M	:	L	M	:	L
80	:	96			
5	:	6	5	:	6

Total distance covered = 11u = 110

1u = 110 ÷ 11 = 10

6u = 60 km

720 km – 60 km = 660 km

Leo met Marcus **660 km** from Town A.

50. FFA 26L (26 × $249.80 = $6494.80)

9L (9 × $249.80 = $2248.20) ___M

WLT 26M (26 × $280.60 = $7295.60)

9L (9 × $249.80 = $2248.20) ___L

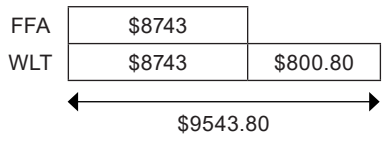
For the first 35 toys (26L + 9L),

FFA earned = $6494.80 + $2248.20 = $8743

For the first 35 toys (26M + 9L),

WLT earned = $7295.60 + $2248.20

= $9543.80



Current difference = $9543.80 – $8743

= $800.80

We need to close up the difference by

= $800.80 – $646.80

= $154

Difference between 1Ladybird and 1Miguel

= $280.60 – $249.80

= $30.80

No. of remaining toy cars = $154 ÷ $30.80

= 5

(a) Total Ladybird toy cars sold by WLT = 9 + 5 = **14**

(b) Total amount of money FFA earned

= $8743 + (5 × $280.60)

= $8743 + 1403

= **$10 146**