

Online Solutions

For P5 ThinkingMath@onSponge

Note : In all solutions, U represents Units

Chapter 1 Whole Numbers

Unit 1.1 – Whole Numbers

Qn 4

1 unit 1 unit

Jerry $\overbrace{\quad 20 \quad 40}^{2 \text{ units}}$

Tommy $\overbrace{\quad 20 \quad +40 \quad +20}^{2 \text{ units}}$

1 unit 2 units

 → \$20 + \$40 + \$20

 = \$80

Jerry at first → 1 unit + \$60

 → \$80 + \$60

 = \$140

Unit 1.2 – More Than/Less Than (External Unchanged)

Qn 3

Dennis $\overbrace{\quad 1 \text{ unit} \quad -30 \quad 120}^{150}$

Jean $\overbrace{\quad \quad \quad}^{3 \text{ units}}$

2 units → 30

1 unit → 15

Dennis at first → 1 unit + 150

 → 15 + 150 → 165

Unit 1.3 – Equal Stage (Beginning/End)

Qn 4

End

Rakesh $\overbrace{\quad 1 \text{ unit} \quad -24}^{\quad}$

Xijie $\overbrace{\quad 1 \text{ unit} \quad 24 \quad +60}^{\quad}$ } 216

2 units + 84 → 216

2 units → 132

1 unit → 132 ÷ 2 → 66

Rakesh at first → 66

Unit 1.4 – Constant Difference Between Individuals

Qn 3

Difference at first = 180 - 120 = 60

End

Girls $\overbrace{\quad \quad \quad}^{3 \text{ units}}$

Boys $\overbrace{\quad \quad \quad}^{30}$

2 \square → 60 \square → 30

No. of pupils who left midway → (120 - 30) × 2 → 90 × 2 → 180



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Qn 5

End

Calvin → 48

Daniel → 2 × 48 → 96

Difference → 48

At first

Daniel $\overbrace{\quad \quad \quad}^{3 \text{ units}}$

Calvin $\overbrace{\quad \quad \quad}^{24}$

2 \square → 48

\square → 24

Daniel at first → 3 \square

 → 3 × 24 → 72

Unit 1.5 – Number of Units x Value of Units

Qn 4

	No. of pupils	x	No. of packet drinks/person	→	Total packet
Girls	3 units	x	3	→	9 units
Boys	1 unit	x	5	→	5 units

Total amount → 5 units + 9 units

 → 14 units

14 units → 350

1 unit → 350 ÷ 14 → 25

Total number of boys → 1 unit → 25

Qn 6

	No.	x	value	→	Total amount
Bolster	1 units	x	\$25	→	25 units
Pillow	3 units	x	\$50	→	150 units
			175 units	→	700
			1 unit	→	4

(a) No. of pillows = 3 units

 = 3 × 4

 = 12

(b) Difference in amount spent = 125 units

 = 125 × 4

 = \$500

Chapter 2 Fractions

Unit 2.1 – Part-Whole Relationship (Type 1)

Qn 4

$\frac{1}{2}$ muffins

$\frac{3}{5}$ cakes

$\frac{1}{2}$ remainder $\frac{2}{5}$ left

$\frac{1}{2} = \frac{5}{10}$ muffins

$\frac{3}{10}$ cakes

$\frac{2}{10}$ left

1 muffin cost → 1 unit

1 cake cost → 3 units

5 cakes cost → 15 units

1 muffin cost → 1 unit

1 cake cost → 3 units

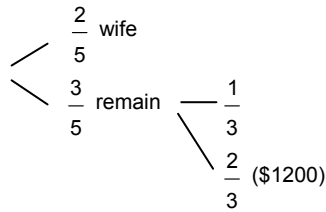
5 cakes cost → 15 units

$\frac{3}{10}$ total → 15 units

$\frac{1}{10}$ total → 5 units

$\frac{5}{10}$ total → 25 units = 25 muffins

Qn 5



$\frac{2}{3}$ remainder \rightarrow \$1200

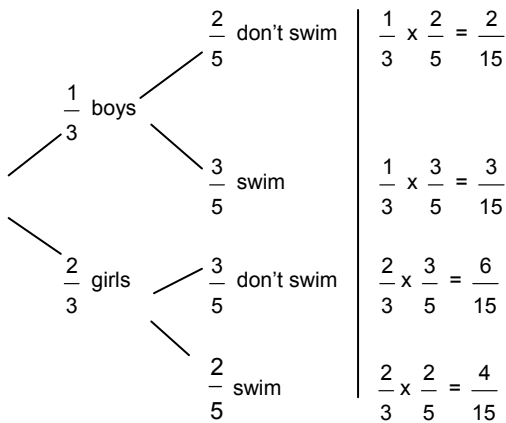
$\frac{1}{3}$ remainder \rightarrow \$600

Remainder \rightarrow \$1800 $\rightarrow \frac{3}{5}$ total

$\frac{1}{5}$ total \rightarrow \$1800 \div 3 \rightarrow \$600

Total \rightarrow \$600 \times 5 \rightarrow \$3000

Qn 6



Total swimmers $\frac{3}{15} + \frac{4}{15} \rightarrow 490$

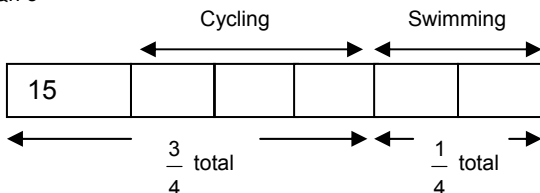
$\frac{7}{15}$ total $\rightarrow 490$

$\frac{1}{15}$ total $\rightarrow 70$

Total $\rightarrow 70 \times 15 = 1050$ pupils

Unit 2.2 – Part-Whole Relationship (Type 2)

Qn 5



Since $\frac{1}{4}$ total $\rightarrow 2$

$\frac{3}{4}$ total $\rightarrow 6$

Qn 5 (Cont.)

3 $\rightarrow 15$

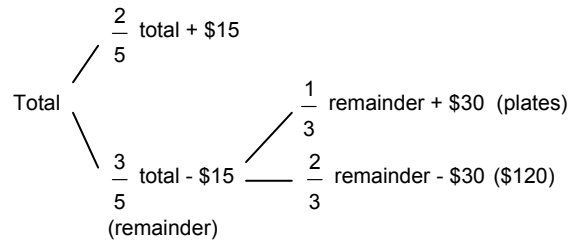
$\rightarrow 5$

Total 8 $\rightarrow 8 \times 5$

$\rightarrow 40$ pupils

Unit 2.3 – Part-Whole Relationship (Type 3)

Qn 5



$\frac{2}{3}$ remainder \rightarrow \$120 + \$30 \rightarrow \$150

$\frac{1}{3}$ remainder \rightarrow \$75

Remainder $\rightarrow 75 \times 3 \rightarrow$ \$225

$\frac{3}{5}$ total - \$15 \rightarrow \$225

$\frac{3}{5}$ total \rightarrow \$225 + 15 \rightarrow \$240

$\frac{1}{5}$ total \rightarrow \$80

Total $\rightarrow 80 \times 5 \rightarrow$ \$400

Unit 2.4 – Equal Fractions

Qn 3

$\frac{3}{5}$ Boys $\rightarrow \frac{4}{7}$ Girls

$\frac{12}{20}$ Boys $\rightarrow \frac{12}{21}$ Girls

Boys $\rightarrow 20$ units

Girls $\rightarrow 21$ units

Difference $\rightarrow 1$ unit $\rightarrow 65$

Total in the end $\rightarrow 24 \times 65 \rightarrow 1560$ pupils

Qn 4

Left amount

Rasidah $\rightarrow \frac{2}{5}$ Chai Seng $\rightarrow \frac{1}{7}$

$\frac{1}{7}$ Chai Seng $\rightarrow \frac{1}{2}$ of what Rasidah left

$\frac{1}{7}$ Chai Seng $\rightarrow \frac{1}{2} \times \frac{2}{5}$ Rasidah

$\frac{1}{7}$ Chai Seng $\rightarrow \frac{1}{5}$ Rasidah

Qn 4 (Cont.)

Chai Seng → 7 units
 Rasidah → 5 units
 Difference → 2 units → \$48
 1 unit → \$24
 Total (Raidah) at first → 5 units
 → 5 x \$24
 = \$120

Qn 6

Left

Roy $\frac{1}{3}$ Dennis $\frac{3}{4}$

$\frac{3}{4}$ Dennis → Twice x $\frac{1}{3}$ Roy

$\frac{3}{4}$ Dennis → $\frac{2}{3}$ Roy

$\frac{6}{8}$ Dennis → $\frac{6}{9}$ Roy

Dennis → 8 units
 Roy → 9 units
 Total 17 units → \$340
 1 unit → \$20
 Dennis in the end → 6 units
 → 6 x \$20
 → \$120

Unit 2.5 – Repeated Identity

Qn 4

<u>Boys</u>	:	<u>Girls</u>	}
1 unit	:	5 units	

Children (6 units)

<u>Adults</u>	:	<u>Children</u>	}
2 units	:	3 units	

x2 x2

<u>Boys</u>	:	<u>Girls</u>	:	<u>Adults</u>
1 unit	:	5 units	:	4 units

Difference between adults and boys
 → 3 units
 3 units → 120
 1 unit → 40
 Total → 10 units
 → 10 x 40 → 400

Qn 6

<u>Square</u>	:	<u>Rectangle</u>	}
2 units	:	5 unit	

x2 x2

Unshaded:	<u>Square</u>	:	<u>Shaded</u>	}
	1 units	:	3 units	

Unshaded	:	<u>Shaded</u>	:	Unshaded
<u>Square</u>	:	3 units	:	<u>Rectangle</u>
1 unit	:	3 units	:	7 units

Thus total unshaded units → 8
 Area of unshaded units given → 72cm²
 1 unit → 72 / 8 = 9

Area of square → 4 units
 Area → 4 x 9cm² → 36 cm²

Unit 2.6 – External Unchanged

Qn 3

Boys	:	2 units x 3	→ 6 units
Girls	:	3 units x 3	→ 9 units

Boys	:	3 units x 2	→ 6 units
Girls	:	5 units x 2	→ 10 units

Increase in girls
 → 1 unit → 4
 No. of pupils in the end
 → 16 units
 → 16 x 4 → 64

Qn 6

<u>Syrup</u>	:	<u>Water</u>	
1 unit	:	2 units	→ 2 units: 4 units

x2 x2

<u>Syrup</u>	:	<u>Water</u>	
2 units	:	5 units	

x6 x6

Increase in water → 1 unit → 200 ml
 Amount of water at first → 4 units
 → 4 x 200 → 800 ml

Unit 2.7 – Unchanged Total

Qn 4

After 1 hour

Answered	1 unit x 5	→ 5 units
Unanswered	1 unit x 5	→ 5 units

After 20 minutes

Answered	4 units x 2	→ 8 units
Unanswered	1 unit x 2	→ 2 units

Transfer → 3 units → 18
 1 unit → 6

Total questions in quiz → 10 units
 → 10 x 6 → 60

Qn 5

Terry	1 unit	x 7	→ 7 units
Chelsia + Dave	3 units	x 7	→ 21 units

Chelsia	2 units	x 4	→ 8 units
Terry + Dave	5 units	x 4	→ 20 units

<u>Terry</u>	:	<u>Chelsia</u>	:	<u>Dave</u>
7 units	:	8 units	:	13 units

Difference between Terry and Dave
 6 units → \$24
 1 unit → \$4
 Cost of present → 28 units
 = 28 x 4
 = \$112

Qn 6

Benson + Daryl	3 units x 5	→ 15 units
Jean	1 unit x 5	→ 5 units

Daryl + Jean	3 units x 4	→ 12 units
Benson	2 units x 4	→ 8 units

<u>Benson</u>	:	<u>Daryl</u>	:	<u>Jean</u>
8 units	:	7 units	:	5 units

Difference between Benson and Jean
 3 units → \$36
 1 unit → \$12

Total sum shared → 20units
 → 20 x \$12
 → \$240

Unit 2.8 – Constant Difference

Qn 4
At first
 Jenny 1 unit x 2 → 2 units
 Daryl 2 units x 2 → 4 units
 Difference 1 unit x 2

End
 Jenny → 1 unit
 Daryl → 3 units
 Difference → 2 units
 Decrease each → 1 unit → 12
 Jenny in the end → 1 unit → 12

Qn 5
At first
 Shop A → 68 kg
 Shop B → 128 kg
 Difference → 60 kg
End
 Shop A → 2 units
 Shop B → 5 units
 Difference → 3 units
 3 units → 60 kg
 1 unit → 20 kg
 Shop A (end) → 2 units → 40kg
 Shop A (sold) → 68 kg - 40 kg
 → 28 kg
 Total sold → 28 kg x 2 = 56kg

Qn 6
 Square 2 unit x 4 → 8 units
 Rectangle 5 units x 4 → 20 units
 Difference 3 units x 4
 Unshaded square 1 unit x 3 → 3 units
 Unshaded rect 5 units x 3 → 15 units
 Difference 4 units x 3
 Decrease each 5 units → 40 cm²
 1 unit → 8 cm²
 Total area of figure
 → 3 units + 15 units + 5 units
 → 23 units
 → 23 x 8
 → 184 cm²

Unit 2.9 – Number of Units x Value of Units

Qn 2
 Red : Yellow Red : Green
 1 unit : 3 units 2 units : 5 units
 x2 x2
 No. x value → Total weight
 Red 2 units x 10g → 20g units
 Yellow 6 units x 15g → 90g units
 Green 5 units x 20g → 100g units
 Total 210g units
 1 unit → 15
 Total green marbles → 5 units → 5 x 15 → 75



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Qn 4
 $\frac{1}{4}$ walk-a-jog | $\frac{1}{4} = \frac{5}{20}$
 $\frac{3}{5}$ soccer | $\frac{3}{4} \times \frac{3}{5} = \frac{9}{20}$
 $\frac{3}{4}$ basketball | $\frac{3}{4} \times \frac{2}{5} = \frac{6}{20}$
 (Remainder)

	No. units	x	value(points)	→	Total (unit points)
Walk-a-jog	5	x	6	→	30
Soccer	9	x	5	→	45
Basketball	6	x	4	→	<u>24</u>
			Total		99
	99 units	→	4950		
	1 unit	→	50		
Total pupils	→ 20 units	→	20 x 50 =		1000

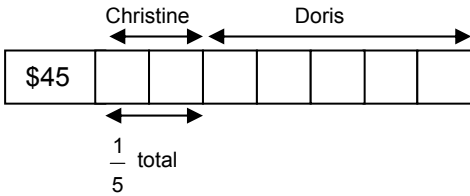
Qn 5
 $\frac{1}{3}$ 20ct → $\frac{2}{3}$ 50ct
 $\frac{2}{6}$ 20ct → $\frac{2}{3}$ 50ct
 20 ct : 50ct
 6 units : 3 units
 50ct : \$1
 3 units : 5 units
 No. units x value (¢) → Total amount (unit ¢)
 6 x 20 → 120
 3 x 50 → 150
 5 x 100 → 500
 770
 770 units → 2310
 1 unit → 3
 Total coins → 6 units + 3 units + 5 units
 → 14 units
 → 14 x 3 → 42 coins

Qn 6
 $\frac{1}{4}$ adults | $\frac{1}{4} = \frac{5}{20}$
 $\frac{3}{4}$ boys | $\frac{3}{4} \times \frac{2}{5} = \frac{6}{20}$
 (Remainder) $\frac{3}{5}$ girls | $\frac{3}{4} \times \frac{3}{5} = \frac{9}{20}$
 No. x value → Total coupons
 Adults 5 units x 5 coupons → 25 units
 Boys 6 units x 4 coupons → 24 units
 Girls 9 units x 3 coupons → 27 units
 Total 76 units
 1 unit → 20
 Total adults 5 units → 5 x 20 → 100

Chapter 3 Ratio

Unit 3.1 – Part-Whole Relationship

Qn 6



$$\frac{1}{5} \text{ total} \rightarrow 2 \square \quad 3 \square \rightarrow 45$$

$$\frac{4}{5} \text{ total} \rightarrow 8 \square \quad \square \rightarrow 15$$

$$\begin{aligned} \text{Total} &\rightarrow 10 \square \\ &\rightarrow 10 \times 5 \rightarrow 150 \end{aligned}$$

Unit 3.2 - Repeated Identity

Qn3

Unshaded Sq : Shaded sq
3 units : 4 units

Shaded rect. : Unshaded rect
2 units : 7 units
x2 : x2

Shaded area 4 units \rightarrow 16 cm²
1 unit \rightarrow 4cm²
Area of figure \rightarrow 3 units + 4 units + 14 units
 \rightarrow 21 units
 \rightarrow 21 x 4 = 84 cm²

Qn 4

Jacintha : Isabel
2 units : 1 unit

Jacintha : Evelyn
1 unit : 4 units
x2 : x2

Jacintha : Isabel : Evelyn
2 units : 1 unit : 8 units

Difference between Evelyn and Isabel
 \rightarrow 7 units \rightarrow 63
1 unit \rightarrow 9
Total \rightarrow 11 units
 \rightarrow 11 x 9 \rightarrow 99

Unit 3.3 – External Unchanged

Qn 3

At first
Pears : Apples
3units : 4 units

End
Pears : Apples
1 unit : 2 units
X3 : x3
3 units : 6 units

Increase in apples \rightarrow 2 units \rightarrow 12
 \rightarrow 1 unit \rightarrow 6
Total \rightarrow 7 units \rightarrow 7 x 6 = 42

Unit 3.4 – Unchanged Total

Qn 5

A	1 unit x 4	}	
T + C + D	4 units x 4		
16	T		3 units x 2
	C + D		5 units x 2
10	C		3 units
	D	7 units	
A	: 7	C	: D
4 units	: 6 units	: 3 units	: 7 units

Difference between A and C
 \rightarrow 3 units \rightarrow \$12
 \rightarrow 1 unit \rightarrow \$4
Cost of present \rightarrow 20 units
 \rightarrow 20 x \$4 \rightarrow \$80

Unit 3.5 – Constant Difference

Qn 5

At first
Square 1 unit x 5 \rightarrow 5 units
Rectangle 3 units x 5 \rightarrow 15 units
Difference 2 units x 5

End
Unshaded Square \rightarrow 2 units x 2 \rightarrow 4 units
Unshaded Rectangle \rightarrow 7 units x 2 \rightarrow 14 units
Difference \rightarrow 5 units x 2

Decrease each \rightarrow 1 unit \rightarrow 20 cm²
Area of square \rightarrow 5 units \rightarrow 5 x 20
 $=$ 100 cm²

Length = 10 cm

Unit 3.6 – Number of Units x Value of Units

Qn 3

Difference in cost \rightarrow 1 unit \rightarrow \$3
Cost of 1 plate \rightarrow 3 units \rightarrow \$9
Cost of 1 cup \rightarrow 2 units \rightarrow \$6

	No.	x	value	\rightarrow	Total sales
Plates	3 units	x	\$9	\rightarrow	\$27 units
Cups	5 units	x	\$6	\rightarrow	\$30 units
Total				\rightarrow	\$57 units
				\rightarrow	\$2850
				1 unit \rightarrow	50

(a) No. of plates sold in 1st month
 \rightarrow 3 units \rightarrow 3 x 50 \rightarrow 150

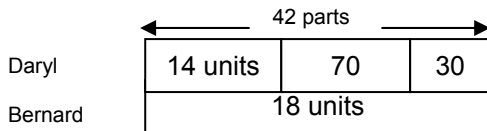
(b) Items sold \rightarrow $\frac{4}{7}$ total \rightarrow 8 units
 \rightarrow 8 x 50
 \rightarrow 400
 $\frac{3}{7}$ total \rightarrow items left
 \rightarrow 300

Unit 3.7 – External Changed (Model)

Qn 6

$$7 \times \left\{ \begin{array}{l} \text{Daryl} \\ 2 \text{ units} \\ +10 \end{array} : \begin{array}{l} \text{Bernard} \\ 3 \text{ units} \\ -5 \end{array} \right\} \times 6$$

$$7 \times 6 \text{ parts} : 7 \text{ parts} \times 6$$



$$\begin{array}{l} 4 \text{ units} \rightarrow 100 \\ 1 \text{ unit} \rightarrow 25 \end{array}$$

No. of stickers Daryl had at first $\rightarrow 2$ units
 $\rightarrow 2 \times 25$
 $\rightarrow 50$

Chapter 4 Average

Unit 4.3 - Average with Unknown Quantity

Qn 3
 Difference in Gareth's results = $13 + 5 = 18$ mark
 Difference in average score = $90 - 87 = 3$ marks
 Total people involved = $18 \div 3 = 6$
 Excluding Gareth himself, he had 5 friends.

Qn 7
 Difference in the individual score = $18 + 9$
 $= 27$ points
 Difference in average score = $85 - 82 = 3$ points
 No. of pupils in the group = $27 \div 3 = 9$

Qn 9
 Total distance = $8.50 \times 4 = 34\text{m}$
 Ukraine + Germany = $34\text{m} - 8.95\text{m} - 7.35\text{m}$
 $= 17.7\text{m}$
 (a) Smallest difference = $9\text{m} - 8.7\text{m} = 0.3\text{m}$
 (b) Biggest difference = $9.7\text{m} - 8\text{m} = 1.7\text{m}$

Unit 4.4 – Average with Repeated Identity

Qn 2
 Total of John + Henry $\rightarrow \$2400 \times 2 = \4800
 Total of Henry + Bernard $\rightarrow \$3000 \times 2 = \6000

Difference between John and Bernard
 $\rightarrow 2$ units $\rightarrow \$ (6000 - 4800) = \1200
 1 unit $\rightarrow \$600$
 John $\rightarrow 5$ units $\rightarrow 5 \times \$600 = \3000
 Henry's salary $\rightarrow \$4800 - \$3000 = \$1800$

Qn 5
 Total (Amos + Bernard) = $\$2800 \times 2 = \5600
 Total (Bernard + Chelsia) = $\$4200 \times 2 = \8400
 Total (Amos + Chelsia) = $\$2600 \times 2 = \5200

Twice the total of Amos + Bernard + Chelsia
 $= \$5200 + \$8400 + \$5600 = \19200

Total amount = $\$19200 \div 2 = \9600
 Average of A + B + C = $\$9600 \div 3 = \3200

Chapter 5 Rate

Unit 5.1 Rate Involving One Object

Qn 5
 5 lessons $\rightarrow \$125$
 1 lesson $\rightarrow \$125 \div 5 \rightarrow \25
 16 lessons $\rightarrow 16 \times \$25 \rightarrow \400

Qn6

In a day, Johnny paint $\frac{1}{8}$ house, Alan paint $\frac{1}{10}$ house

Together, they paint $\frac{1}{8} + \frac{1}{10} = \frac{5}{40} + \frac{4}{40} = \frac{9}{40}$

$\frac{9}{40}$ house take both 1 day, $\frac{1}{40}$ house take both $\frac{1}{9}$ day

The whole house will take both $\frac{40}{9}$ days = $4\frac{4}{9}$

Unit 5.2 – Rate Involving Two Different Objects

Qn 2

In 1 hour, Johny can paint $\frac{1}{6}$ house

Together, Johny and Ramesh can paint $\frac{1}{3}$ house

Ramesh alone can paint $\frac{1}{3} - \frac{1}{6} = \frac{1}{6}$ house

$\frac{1}{6}$ house take Ramesh 1 hour

Whole house will take Ramesh 6 hours

Unit 5.3 – Rate Involving Three Different Objects

Qn 2

In an hour, 1st tap fills $\frac{1}{4}$ tank, 2nd tap fills $\frac{1}{3}$ tank

In 1 hour, both fill $\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$ tank

Left $\rightarrow \frac{5}{12}$ tank

In 1 hour, 3rd tap drains $\frac{1}{2}$ tank

With 1st and 3rd taps turned on $\rightarrow \frac{1}{2} - \frac{1}{4}$
 $= \frac{1}{4}$ tank was drained

Time taken to completely drain tank $\rightarrow \frac{7}{12} \div \frac{1}{4}$
 $= \frac{7}{12} \times \frac{4}{1} = \frac{7}{3}$
 $= 2\frac{1}{3}$ hour

Chapter 6 Angles I

Unit 6.1 – Angles on a Straight Line

Qn 3

$$\begin{aligned} 80^\circ - 60^\circ &= 120^\circ \\ 8 \text{ units} &\rightarrow 120^\circ \\ 1 \text{ unit} &\rightarrow 15^\circ \\ \angle y &\rightarrow 5 \text{ units} \rightarrow 5 \times 15^\circ = 75^\circ \\ \angle x &\rightarrow 3 \text{ units} \rightarrow 3 \times 15^\circ = 45^\circ \end{aligned}$$

Unit 6.2 – Vertically Opposite Angles

Qn 3

$$\begin{aligned} \angle x + \angle y &= 120^\circ \text{ (vertically opposite } \angle) \\ &\quad 3 \text{ units} \rightarrow 120^\circ \\ &\quad 1 \text{ unit} \rightarrow 40^\circ \\ \angle x &\rightarrow 2 \text{ units} \rightarrow 2 \times 40^\circ = 80^\circ \\ \angle y &\rightarrow 1 \text{ unit} \rightarrow 1 \times 40^\circ = 40^\circ \end{aligned}$$

Qn 6

$$\begin{aligned} \angle x &= 42^\circ \text{ (vertically opposite angle)} \\ \angle y &= 180^\circ - 83^\circ - 42^\circ = 55^\circ \text{ (angle on straight line)} \end{aligned}$$

Unit 6.3 – Alternate, Corresponding & Interior Angles

Qn 3

$$\begin{aligned} \angle z &= 180^\circ - 56^\circ - 34^\circ = 90^\circ \text{ (angle on straight line)} \\ 2x &= 180^\circ - 34^\circ - 90^\circ \text{ (alternate angle)} = 56^\circ \\ x &= 28^\circ \\ 3y &= 180^\circ - 90^\circ \text{ (alternate angle)} = 90^\circ \\ y &= 30^\circ \end{aligned}$$

Qn 8

$$\begin{aligned} \angle BEG &= 60^\circ \text{ (alternate angle)} \\ \angle x &= 60^\circ \div 2 = 30^\circ \text{ (angle bisector)} \\ \angle z &= 180^\circ - 30^\circ = 150^\circ \text{ (interior angle)} \\ \angle y &= 180^\circ - 30^\circ - 55^\circ = 95^\circ \end{aligned}$$

Unit 6.4 – Isosceles Triangle

Qn 3

$$\begin{aligned} \angle PQR &= 55^\circ \text{ (isosceles } \Delta) \\ \angle PRQ &= 180^\circ - 55^\circ - 55^\circ \text{ (sum of } \Delta) = 70^\circ \\ \angle PRS &= 180^\circ - 70^\circ \text{ (Angle on straight line)} = 110^\circ \\ \angle SRT &= 180^\circ - 110^\circ \\ &= 70^\circ \text{ (angle on straight line)} \\ \angle RST &= 180^\circ - 70^\circ - 70^\circ = 40^\circ \end{aligned}$$

Qn 7

$$\begin{aligned} \frac{180^\circ - 75^\circ}{2} &= 55^\circ \\ 180^\circ - 30^\circ - 30^\circ &= 120^\circ \\ \angle y &= 360^\circ - 120^\circ = 240^\circ \\ \angle x &= 55^\circ - 30^\circ = 25^\circ \end{aligned}$$

Qn 9

$$\begin{aligned} \angle PQR &= 55^\circ \text{ (isosceles } \Delta) \\ \angle PRQ &= 180^\circ - 55^\circ - 55^\circ \text{ (sum of triangle)} = 70^\circ \\ \angle PRS &= 180^\circ - 110^\circ \text{ (angle on straight line)} = 70^\circ \\ \angle SRT &= 180^\circ - 110^\circ = 70^\circ \text{ (angle on straight line)} \\ \angle RST &= 180^\circ - 70^\circ - 70^\circ = 40^\circ \text{ (isosceles } \Delta) \end{aligned}$$

Chapter 7 Angles II (Closed Figures)

Unit 7.1 – Interior and Exterior Angles Within A Triangle

Qn 4

$$\begin{aligned} \angle y &= 42^\circ + 54^\circ \\ &= 96^\circ \text{ (2 internal } \angle = 1 \text{ external } \angle) \\ 180^\circ - 96^\circ &= 84^\circ \\ \angle x &= 180^\circ - 84^\circ - 20^\circ = 76^\circ \end{aligned}$$

Qn 5

$$\begin{aligned} \angle a + \angle b + 20^\circ &= \angle c + \angle d + 20^\circ = 180^\circ \text{ (sum of } \angle \text{ s in } \Delta) \\ \angle a + \angle b + \angle c + \angle d &= (180^\circ \times 2) - 20^\circ - 20^\circ \\ &= 360^\circ - 40^\circ = 320^\circ \end{aligned}$$

Qn 7

$$\begin{aligned} \angle WUV &= \angle b + \angle d \text{ (2 internal } \angle = 1 \text{ external } \angle) \\ \angle UWV &= \angle a + \angle c \text{ (2 internal } \angle = \text{ external } \angle) \\ \angle a + \angle b + \angle c + \angle d + 20^\circ &= 180^\circ \text{ (sum of } \Delta) \\ \angle a + \angle b + \angle c + \angle d &= 160^\circ \end{aligned}$$

Qn 8

$$\begin{aligned} \angle a + \angle b + \angle c + \angle d + \angle e + \angle f &= (180^\circ \times 3) - 180^\circ = 360^\circ \\ \text{Since the sum of } \angle \text{ of } \Delta RSV &= 180^\circ \end{aligned}$$

Unit 7.2 – Angle Properties Within A Rhombus

Qn 2

$$\begin{aligned} \angle QPB &= 180^\circ - 114^\circ = 66^\circ \\ \text{(a) } \angle QPR &= \frac{66^\circ}{2} = 33^\circ \\ \text{(b) } \angle QCB &= 96^\circ \\ \text{(c) } \angle RSC &= 180^\circ - 84^\circ - 33^\circ = 63^\circ \end{aligned}$$

Qn 3

$$\begin{aligned} \angle ADC &= 180^\circ - 130^\circ = 50^\circ \\ \angle x &= \frac{50^\circ}{2} = 25^\circ \end{aligned}$$

Qn 4

$$\begin{aligned} 180^\circ - 45^\circ - 90^\circ - 30^\circ &= 15^\circ \\ \angle x &= 15^\circ \end{aligned}$$

Qn 7

$$\begin{aligned} \angle FBD &= 180^\circ - 70^\circ - 45^\circ = 65^\circ \\ \angle x &= 65^\circ \div 2 = 32.5^\circ \\ \angle BDE &= 180^\circ - 65^\circ = 115^\circ \\ 70^\circ + \angle y &= 115^\circ \text{ (2 internal } \angle = 1 \text{ external } \angle) \\ \angle y &= 115^\circ - 70^\circ = 45^\circ \end{aligned}$$

Qn 10

$$\begin{aligned} \angle DAO &= 45^\circ \text{ (diagonal of square)} \\ \angle DAE &= 180^\circ - 90^\circ - 60^\circ = 30^\circ \text{ (sum of } \Delta) \\ \angle y &= 45^\circ - 30^\circ = 15^\circ \\ \angle x &= 15^\circ + 90^\circ = 105^\circ \text{ (2 internal } \angle = 1 \text{ external } \angle) \end{aligned}$$

Unit 7.3 – Angles Properties Within a Parallelogram

Qn 2

$$\begin{aligned} \angle x &= 25^\circ \text{ (alternate } \angle) \\ \angle y &= 42^\circ + 25^\circ \\ &= 67^\circ \text{ (2 internal } \angle = 1 \text{ external } \angle) \\ \angle z &= 180^\circ - 80^\circ - 42^\circ - 25^\circ = 33^\circ \text{ (sum of } \Delta) \end{aligned}$$

Qn 4

$$\begin{aligned} \angle BAC &= 30^\circ \text{ (alternate } \angle) \\ \angle CAD &= 180^\circ - 30^\circ - 20^\circ = 130^\circ \\ \text{(a) } \angle ADC &= 180^\circ - 130^\circ - 30^\circ = 20^\circ \text{ (sum of } \Delta) \\ \text{(b) } \angle CAD &= 130^\circ \\ \text{(c) } \angle ACB &= 180^\circ - 20^\circ - 30^\circ = 130^\circ \end{aligned}$$

Unit 7.4 – Angle Properties Within A Trapezium

Qn 2

$$\begin{aligned} 180^\circ - 118^\circ &= 62^\circ \text{ (} \angle \text{ on straight line)} \\ \angle y &= 180^\circ - 84^\circ - 62^\circ = 34^\circ \text{ (sum of } \Delta) \\ \angle x &= 34^\circ \text{ (alternate } \angle) \end{aligned}$$

Qn 5

$$\begin{aligned} \angle BFC &= 54^\circ \text{ (alternate } \angle) \\ \text{(a) } \angle t &= 180^\circ - 57^\circ - 54^\circ = 69^\circ \\ \text{(b) } \angle y &= 69^\circ - 54^\circ = 15^\circ \\ \text{(c) } \angle BAF &= 54^\circ \text{ (isosceles } \Delta) \\ \angle x &= 180^\circ - 54^\circ - 54^\circ \\ &= 72^\circ \text{ (sum of isosceles } \Delta) \\ \text{(d) } \angle u &= \angle CBE = 57^\circ \text{ (alternate } \angle) \end{aligned}$$

Unit 7.5 – Angle Properties Within a Circle

Qn 3

$$\begin{aligned} \angle BCD &= 48^\circ \text{ (alternate } \angle) \\ 3X &= 48^\circ + 48^\circ \text{ (2 internal } \angle = 1 \text{ external } \angle) \\ &= 96^\circ \\ X &= 32^\circ \end{aligned}$$

Qn 5

$$\begin{aligned} \angle AOC &= 180^\circ - 60^\circ = 120^\circ \text{ (interior } \angle) \\ \angle a + \angle b + \angle c + \angle d &= 360^\circ - 120^\circ = 240^\circ \text{ (sum of } \angle \text{ of } 2\Delta\text{s)} \end{aligned}$$

Qn 7

$$\begin{aligned} \angle p &= \frac{180^\circ - 100^\circ}{2} = 40^\circ \text{ (sum of isosceles } \Delta) \\ \angle q &= \frac{180^\circ - 40^\circ}{2} = 70^\circ \text{ (sum of isosceles } \Delta) \\ \angle r &= 360^\circ - 100^\circ - 40^\circ = 220^\circ \end{aligned}$$

Chapter 8 Area of Triangle

Unit 8.1 – Area of Triangle

Qn 8

$$\begin{aligned} \text{Area of shaded } \Delta BCD &= \left(\frac{1}{2} \times 20 \times CE\right) = \left(\frac{1}{2} \times 16 \times 15\right) \\ CE &= \frac{16 \times 15}{20} = 12\text{cm} \end{aligned}$$

Qn 10

$$\begin{aligned} \text{Area of shaded } \Delta ABC &= \left(\frac{1}{2} \times 12 \times AB\right) = \left(\frac{1}{2} \times 28 \times 18\right) \\ AB &= \frac{28 \times 18}{12} = 42\text{cm} \end{aligned}$$

Unit 8.2 – Finding the Area of a Triangle in Unit Squares

Qn 3

(a) Shaded

$$\begin{aligned} &= (6 \times 6) - \left(\frac{1}{2} \times 4 \times 2\right) - \left(\frac{1}{2} \times 3 \times 2\right) - \left(\frac{1}{2} \times 3 \times 1\right) - \left(\frac{1}{2} \times 4 \times 2\right) \\ &= 36 - 4 - 3 - 1.5 - 4 = 23.5 \text{ cm}^2 \end{aligned}$$

(b) Shaded

$$\begin{aligned} &= (6 \times 6) - \left(\frac{1}{2} \times 5 \times 4\right) - (4 \times 2) - \left(\frac{1}{2} \times 2 \times 2\right) - \left(\frac{1}{2} \times 6 \times 1\right) \\ &= 36 - 10 - 8 - 2 - 3 = 13 \text{ cm}^2 \end{aligned}$$

Qn 4

(a) Area of rectangle = 6 cm x 5 cm = 30 cm²
 Area of Region A = $\frac{1}{2} \times 6 \text{ cm} \times 1 \text{ cm} = 3 \text{ cm}^2$
 Area of Region B = $\frac{1}{2} \times 5 \text{ cm} \times 3 \text{ cm} = 7.5 \text{ cm}^2$
 Area of region C = $\frac{1}{2} \times 2 \text{ cm} \times 3 \text{ cm} = 3 \text{ cm}^2$
 Shaded area = 30 cm² - 3 cm² - 7.5 cm² - 3 cm² = 16.5 cm²

(b) Area of rectangle = 6 cm x 6 cm = 36 cm²
 Area of Region A = $\frac{1}{2} \times 4 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$
 Area of Region B = $\frac{1}{2} \times 2 \text{ cm} \times 3 \text{ cm} = 3 \text{ cm}^2$
 Area of region C = $\frac{1}{2} \times 6 \text{ cm} \times 3 \text{ cm} = 9 \text{ cm}^2$
 Shaded area = 36 cm² - 9 cm² - 4 cm² - 3 cm² = 20 cm²

Unit 8.3 – Triangle with Common Base or Height

Qn 3

$$\begin{aligned} \text{Area of big triangle} &= \frac{1}{2} \times 20 \times 10 = 100\text{cm}^2 \\ \text{Area of small triangle} &= \frac{1}{2} \times 10 \times 10 = 50\text{cm}^2 \\ \text{Area of shaded parts} &= 100\text{cm}^2 + 50\text{cm}^2 = 150\text{cm}^2 \end{aligned}$$

Qn 5

$$\begin{aligned} \text{Area of 1 triangle} &= \frac{1}{2} \times b \times h = \frac{1}{2} \times 10 \times 10 = 50 \text{ cm}^2 \\ \text{Area of shaded parts} &= 2 \text{ triangles} = 2 \times 50\text{cm}^2 = 100\text{cm}^2 \end{aligned}$$

Qn 6

$$\begin{aligned} \Delta DEC &\text{ is } \frac{1}{4} \text{ of square ABCD} \\ \Delta CBF &\text{ is } \frac{1}{4} \text{ of square ABCD} \\ \Delta AEF &\text{ is } \frac{1}{8} \text{ of square ABCD} \end{aligned}$$

Qn 6 (Cont.)

$$\begin{aligned} \text{Shaded triangle} &= 1 - \frac{1}{4} - \frac{1}{4} - \frac{1}{8} \\ &= 1 - \frac{2}{8} - \frac{2}{8} - \frac{1}{8} \\ &= \frac{3}{8} \text{ square ABCD} \\ &= \frac{3}{8} \times 48\text{cm}^2 = 18\text{cm}^2 \end{aligned}$$

Qn 7

$$\text{Area of shaded triangle} = \frac{1}{2} \times 7 \times 5 = 17.5\text{cm}^2$$

Unit 8.4 – Triangles with Common Bases

Qn 2

$$\text{Area of shaded parts} = \frac{1}{2} \times 20 \times 12 = 120\text{cm}^2$$

Qn 3

Since the 2 Δs share the same base AC
 BE : DF = Area of Δ ABC : Area of Δ ADC
 = 1 : 3
 Difference in area = shaded part
 = 2 units → 64 cm²
 1 unit → 32 cm²

$$\frac{1}{2} \times AC \times BE = 32\text{ cm}^2$$

$$\frac{1}{2} \times AC \times 4 = 32\text{ cm}^2$$

$$AC = 32 \div 2 = 16\text{cm}$$

Qn 5

Since the 2 Δs share the same base BD
 AE : FC = 5 : 3
 Area of Δ ABD : Area of Δ BCD
 = 5 : 3
 Area of Δ ABD → 30cm² : 18cm²

$$\text{Entire quadrilateral} \rightarrow 30\text{cm}^2 + 18\text{cm}^2 = 48\text{cm}^2$$

Qn 6

Area of shaded region
 $\rightarrow \left(\frac{1}{2} \times 8 \times 20\right) + \left(\frac{1}{2} \times 12 \times 25\right)$
 $= 80\text{ cm}^2 + 150\text{ cm}^2 = 230\text{ cm}^2$

Unit 8.5 – Composite Figures Involving Triangles

Qn 2

$$\text{Area of 1 triangle} \rightarrow \frac{1}{2} \times 12 \times 10 = 60\text{cm}^2$$

$$\text{Area of 8 triangles} \rightarrow 60\text{cm}^2 \times 8 = 480\text{cm}^2$$

Qn 4

$$P + R \rightarrow \frac{1}{2} \text{ rectangle ABCD} = Q + S$$

$$S \rightarrow 24\text{cm}^2 + 45\text{cm}^2 - 20\text{cm}^2 = 49\text{cm}^2$$

Chapter 9 Percentage

Unit 9.1 – More than in Percentage

Qn 3

$$10\% \text{ of } \$60 = \frac{10}{100} \times \$60 = \$6$$

Total bill → \$66

Each friend pays \$66 ÷ 3 = \$22

Qn 6

Boys → 125% (5 units)
 Girls → 100% (4 units)
 Difference 1 unit → 12
 Total 9 units → 9 × 12 → 108

Unit 9.2 – Less Than In Percentage

Qn 4

Men → 75% (3 units)
 Women → 100% (4 units)
 Difference 1 unit → 50
 Total → 7 units → 7 × 50 → 350

Qn 5

Green → 30% (3 units)
 Blue → 100% (10 units)
 Difference 7 units → 28
 1 unit → 4
 Total green → 3 units → 3 × 4 → 12

Qn 7

Boys → 25% (1 unit)
 Girls → 100% (4 units)

$$\% \text{ Difference} \rightarrow \frac{4\text{units} - 1\text{unit}}{1\text{unit}} \times 100\% = 300\%$$

Unit 9.3 – Multiplication in Percentage

Qn 7

Chinese : Malay : English
 4 : 3 : 6

Total → 13 units → 3900
 1 unit → 300

Chinese → 4 × 300 → 1200
 Malay → 3 × 300 → 900
 English → 6 × 300 → 1800

$$\text{Increase in Chinese} \rightarrow \frac{20}{100} \times 1200 = 240$$

$$\text{Increase in Malay} \rightarrow \frac{10}{100} \times 900 = 90$$

$$\text{Increase in English} \rightarrow 510 - 240 - 90 = 180$$

$$\% \text{ increase in English} \rightarrow \frac{180}{1800} \times 100\% = 10\%$$



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Qn 10

Length → 20cm Breadth → 16cm
 Area → $20 \times 16 = 320 \text{ cm}^2$

Increase in length → $\frac{25}{100} \times 20\text{cm} = 5\text{cm}$

Increase in breadth → $\frac{25}{100} \times 16\text{cm} = 4\text{cm}$

New length → 25cm
 New breadth → 20cm
 New area → $25 \times 20 = 500\text{cm}^2$

% increase in area → $\frac{500 - 320}{320} \times 100\% = 56.25\%$

Qn 12

April

100 → Spend 75%
 → Save 25%

May

120% → Spend $\frac{75}{100} \times 120\% = 90\%$

→ Save 30%

Increase in spending → $90\% - 75\%$
 → 15% → \$450

Salary in May → 1% → \$30
 → 120% → $120 \times \$30 \rightarrow \3600

Unit 9.4 – Overlapping Percentage

Qn 4

$100\% - 16\% = 84\%$

$82\% + 54\% = 136\%$

Percentage of pupils who do not like any of the 2 sports
 → $136\% - 84\% = 52\%$

No. of pupils who enjoyed both swimming and jogging

→ $\frac{52}{100} \times 200 = 104$

Unit 9.5 – Profit and Loss

Qn 4

$20\% - 5\% = 15\%$

15% of selling price → $\$75 - \$30 \rightarrow \$45$

1% of selling price → \$3

95% of selling price → $95 \times \$3 \rightarrow \285

Cost price → $\$285 - \$75 \rightarrow \$210$

OR

80% of selling price → $\$80 \times 3 \rightarrow \240

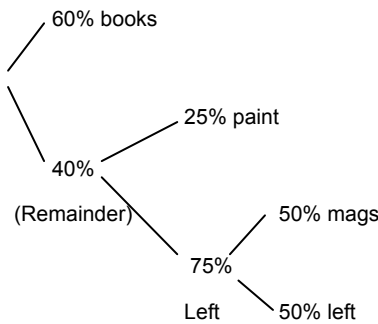
Cost price → $\$240 - \$30 \rightarrow \$210$



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Unit 9.6 – Part-Whole Relationship

Qn 3



$$\frac{3}{5} = \frac{24}{40}$$

$$\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{4}{40}$$

$$\frac{2}{5} \times \frac{3}{4} \times \frac{1}{2} = \frac{6}{40}$$

$$\frac{2}{5} \times \frac{3}{4} \times \frac{1}{2} = \frac{6}{40}$$

(a) Fraction on money left

$$= \frac{6}{40} = \frac{3}{20}$$

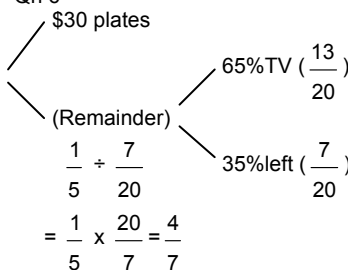
(b) $\frac{24}{40}$ total - $\frac{6}{40}$ total = $\frac{18}{40}$ total = $\frac{9}{20}$ total

$$\frac{9}{20}$$
 total → \$36

$$\frac{1}{20}$$
 total → \$4

Total → $\$4 \times 20 \rightarrow \80

Qn 6



$$20\% \text{ total} = \frac{1}{5}$$

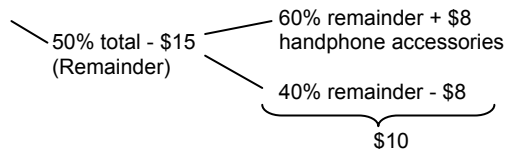
$$\frac{3}{7}$$
 total → \$30

$$\frac{1}{7}$$
 total → \$10

Total → \$70

Qn 9

50% total + \$15 game cartridge



40% remainder → \$18

20% remainder → \$9

Remainder → $\$9 \times 5 \rightarrow \45

50% total → $\$45 + \$15 \rightarrow \$60$

Total → $\$60 \times 2 \rightarrow \120

Qn 12
 45% total + \$31 shoes
 55% total - \$31 (Remainder)
 25% remainder + \$20 Skirt
 75% remainder - \$20
 \$130

75% remainder → \$150
 1% remainder → \$2
 Remainder → \$200
 55% total - \$31 → \$200
 55% total → \$200 + \$31 → \$231
 5% total → \$231 ÷ 11 → \$21
 100% Total → \$21 x 20 → \$420

Unit 9.7 – Equal Fractions

Qn 3
 40% of boys → 10% of girls
 $\frac{2}{5}$ of boys → $\frac{1}{10}$ of girls
 $\frac{2}{5}$ of boys → $\frac{2}{20}$ of girls

Boys → 5 units
 Girls → 20 units
 Difference → 15 units → 510
 1 unit → 34
 Total pupils in the end → 4 units
 → 4 x 34 → 136

Qn 5
 Chocolate left is equal to twice cheese left
 20% chocolate → 2 x 25% cheese
 20% chocolate → 50% cheese
 $\frac{1}{5}$ chocolate → $\frac{1}{2}$ cheese
 Total → 7 units → 350
 → 1 unit → 50
 Total chocolate muffins given away
 → 4 units → 4 x 50 → 200

Unit 9.8 – External Unchanged

Qn 2
At first
 Children : 40% (2 units) x 3 → 6 units
 Adults : 100% (5 units) x 3 → 15 units
End
 Children : 60% (3 units) x 2 → 6 units
 Adults : 40% (2 units) x 2 → 4 units

Decrease in adults → 11 units → 22
 → 1 unit → 2
 Total children in the bus → 6 units
 → 6 x 2 → 12

Qn 4
At first
 Girls : 40% (2 units) x 3 → 6 units
 Boys : 60% (3 units) x 3 → 9 units
End
 Girls : 55% (11 units)
 Boys : 45% (9 units)

Increase in girls → 5 units → 20
 → 1 unit → 4
 No. of boys at telematch → 9 units
 → 9 x 4 → 36

Units 9.9 – Repeated Identity

Qn 4
 Boys : 40% (2 units) x 5
 Girls : 100% (5 units) x 5
 Adults : 120% (6 units) x 7
 Children : 100% (5 units) x 7
 A : B : G
 42 : 10 : 25

Difference → 42 units – 25 units
 → 17 units → 34
 → 1 unit → 2
 Total people at the party → 77 units
 → 77 x 2 → 154

Qn 7
 Yeo : 160% (8 units)
 Lim : 100% (5 units)
 Tang : 75% (3 units) x 2
 Yeo : 100% (4 units) x 2
 Y : L : T
 8u : 5u : 6u

Tang : 6U x 1.5 → 9U (Difference of 3U)
 Yeo & Lim gave away in ratio of 3:1 (total of 4p)
 Since 3U → 4p
 x 4
 12U → 4p
 3U → 1p

Y : L : T
 8u : 5u : 6u
 $\frac{x4}{32u}$ $\frac{x4}{20u}$ $\frac{x4}{24u}$
 -9u -3u +12u
 23u 17u 36u

Difference → 23 units – 17 units
 → 6 units → 240
 → 1 unit → 40

Yeo gave Tang 9 units → 9 x 40 → 360

Unit 9.10 – Unchanged Total

Qn 2
1st day
 Fixed : 45% (9 units)
 Unfixed : 55% (11 units)

2nd day
 Fixed : 75% (3 units) x 5 → 15 units
 Unfixed : 25% (1 unit) x 5 → 5 units

Transfer → 6 units → 60
 → 1 unit → 10

Total pieces in puzzle → 20 units
 → 20 x 10 → 200

Qn 5
 Read : 40% (2 units) x 5 → 10 units
 Unread : 100% (5 units) x 5 → 25 units

Read : 60% (3 unit) x 7 → 21 units
 Unread : 40% (2 unit) x 7 → 14 units

Transfer → 11 units → 22
 → 1 unit → 2

Total pages → 35 units → 35 x 2 → 70

Qn 7

Gerald : 45% (9 units)
 Xavier + Joshua : 55% (11 units)

Xavier : 25% (1 unit) $\times 4 \rightarrow 4u$
 Gerald + Joshua : 100% (4 units) $\times 4 \rightarrow 16u$

G	:	X	:	J
9	:	4	:	7

Difference between Gerald and Xavier
 $\rightarrow 5 \text{ units} \rightarrow 25$
 $\rightarrow 1 \text{ unit} \rightarrow 5$

Total cookies $\rightarrow 20 \text{ units} \rightarrow 20 \times 5 \rightarrow 100$

Unit 9.11 – Constant Difference

Qn 3

At first
 $X : Y = 10 : 12$

End
 $X : Y = 3 : 5$

10 units $\rightarrow 1680$
 1 unit $\rightarrow 168$
 3 units $\rightarrow 168 \times 3 = 504$

Qn 5

Small Square : 40% (2 units) $\times 2 \rightarrow 4 \text{ units}$
 Big Square : 100% (5 units) $\times 2 \rightarrow 10 \text{ units}$
 Difference $\rightarrow 3 \text{ units} \times 2 \rightarrow 6 \text{ units}$

Unshaded small: 1 unit $\times 3 \rightarrow 3 \text{ units}$
 Unshaded big : 3 units $\times 3 \rightarrow 9 \text{ units}$
 Difference $\rightarrow 2 \text{ units} \times 3 \rightarrow 6 \text{ units}$

Decrease each $\rightarrow 1 \text{ unit} \rightarrow 20\text{cm}^2$
 Area (small square) $\rightarrow 4 \text{ units} \rightarrow 3 \times 20 \rightarrow 80\text{cm}^2$

Unit 9.12 – External Changed

Qn 2

	<u>Elias</u>	<u>Ramesh</u>	
$4x \left\{ \right.$	45% (9 units)	100% (20 units)	$\left. \right\} \times 3$
	$+39$	$+20$	
$4x$	75% (3p)	100% (4p) $\times 3$	

Elias	36 units	156
Ramesh	60 units	60

24 units $\rightarrow 96$
 1 unit $\rightarrow 4$
 Total Elias at first $\rightarrow 9 \text{ units}$
 $\rightarrow 9 \times 4 \rightarrow 36$

Qn 5

	<u>Chickens</u>	<u>Ducks</u>
$4x \left\{ \right.$	5 units	8 units
	-50	-8
$4x$	(25%)1p	4p (100%)

Chickens	20 units	8
Ducks	8 units	200

12 units $\rightarrow 192$
 1 unit $\rightarrow 16$
 Ducks at first $\rightarrow 8 \text{ units}$
 $\rightarrow 8 \times 16 \rightarrow 128$

Chapter 10 Volume

Unit 10.1 – Finding Volume of a Cuboid with Given Dimension

Qn 3

Capacity of tank = $L \times B \times H$
 $= 30\text{cm} \times 20 \text{ cm} \times 12\text{cm}$
 $= 7200\text{cm}^3$

Qn 7

Volume of water = $L \times B \times H$
 $= \frac{2}{3} \times 18 \text{ cm} \times 18\text{cm} \times 24\text{cm}$
 $= 2592\text{cm}^3$

Qn 11

Breadth = $\frac{1}{4} \times 200\text{cm} = 50\text{cm}$

Height = $\frac{1}{2} \times 50\text{cm} = 25\text{cm}$

Capacity of tank = $L \times B \times H$
 $= 220\text{cm} \times 50 \text{ cm} \times 25\text{cm}$
 $= 250\,000\text{cm}^3 = 250 \text{ litre}$

Unit 10.2 – Finding Dimension with Given Volume

Qn 5

Volume of water = $L \times B \times H$
 $2880\text{cm}^3 = 3 \text{ units} \times 3 \text{ units} \times 5 \text{ units}$
 Therefore 1 unit $\times 1 \text{ unit} \times 1 \text{ unit}$
 $= \frac{2880}{3 \times 3 \times 5} = \frac{2880}{45} = 64\text{cm}^3$
 1 unit = 4cm
 Since $(4 \times 4 \times 4) = 64$
 Area of base = $3 \text{ units} \times 3 \text{ units}$
 $= (3 \times 4) \times (3 \times 4) = 144\text{cm}^2$

Unit 10.3 – Length, Area and Volume of Cubes

Qn 3

Since $L \times B \times H = 125$
 and $L = B = H$
 $L = 5\text{cm}$
 Area of shaded face = $L \times B = 5\text{cm} \times 5 \text{ cm} = 25\text{cm}^2$

Qn 5

Volume X : Volume Y = 27 : 1
 Volume Y $\rightarrow 1 \text{ unit} \rightarrow 1\text{cm}^3$
 Volume X $\rightarrow 27 \text{ units} \rightarrow 27\text{cm}^3$
 Edge of cube X $\rightarrow 3\text{cm}$
 Since $(3 \times 3 \times 3) = 27$

Qn 8

Length C : Length D
 $= 3 : 4$
 Volume C : Volume D
 $= (3 \times 3 \times 3) : (4 \times 4 \times 4)$
 $= 27 : 64$
 Volume D $\rightarrow 64 \text{ units} \rightarrow 128\text{cm}^3$
 $\rightarrow 1 \text{ unit} \rightarrow 2\text{cm}^3$
 Volume C $\rightarrow 27 \times 2 \rightarrow 54\text{cm}^3$

Unit 10.4 – Volume and Area of Unit Cubes

Qn 7
 Front : 8 faces
 Back : 8 faces
 Left : 9 faces
 Right : 9 faces
 Top : 10 faces
 Bottom : 10 faces
 Total : 54 faces
 Total area to be painted = $54 \times 1\text{cm}^2 = 54\text{cm}^2$

Unit 10.5 – Volume = Base Area x Height

Qn 4
 Total volume $\rightarrow 3.5 \times 1000 \times 5 \times 60 = 1\,050\,000\text{cm}^3$
 Depth at first $\rightarrow \frac{1\,050\,000}{125 \times 84} = 100\text{cm}$

Qn 6
 Volume of water leaked $\rightarrow (400 + 300) \times 6 = 4\,200\text{cm}^3$
 Depth at first $\rightarrow \frac{4\,200}{60 \times 10} = 7\text{cm}$
 New height $\rightarrow 15\text{cm} - 7\text{cm} = 8\text{cm}$

Qn 8

Length	: Breadth	Breadth	: Height
3	: 2	5	: 4
x5	: x5	x2	: x2
15	: 10	10	: 8

Length : Breadth : Height
 15 : 10 : 8

Height $\rightarrow 8\text{ cm} \times 2 = 16\text{cm}$
 8units $\rightarrow 16\text{cm}$
 1 unit $\rightarrow 2\text{ cm}$
 Length $\rightarrow 15\text{ units} \rightarrow 15 \times 2\text{ cm} = 30\text{ cm}$
 Breadth $\rightarrow 10\text{ units} \rightarrow 10 \times 2\text{ cm} = 20\text{ cm}$
 Capacity $\rightarrow L \times B \times H \rightarrow 30\text{cm} \times 20\text{cm} \times 16\text{cm} = 9600\text{cm}^3$

Unit 10.6 – Volume Involving Displacement

Qn 4
 $\frac{2}{3}$ tank = 3600cm^3
 $\frac{1}{3}$ tank = 1800cm^3
 Total tank = $1800\text{cm}^3 \times 3 = 5400\text{cm}^3$

$$\text{Base area} = \frac{5400}{60} = 90\text{cm}^2$$

Qn 7
 Space in tank
 $= (50 \times 20 \times 35) - (3 \times 10 \times 10 \times 10)$
 $= 32\,000\text{cm}^3$

(a) Time needed to fill the tank
 $= \frac{32\,000\text{cm}^3}{8\,000\text{cm}^3} = 4\text{ min}$

(b) Decrease in depth = $\frac{2 \times 10 \times 10 \times 10}{50 \times 20}$
 $= 2\text{cm}$

Depth of water = $35\text{cm} - 2\text{cm} = 33\text{cm}$

Unit 10.7 Volume with Common Base or Height

Qn 2
 When height is the same,
 Ratio of volume \rightarrow ratio of base area
 Base area A : Base area B
 $= (25 \times 12) : (20 \times 20)$
 $= 300 : 400$
 $= 3 : 4$
 Volume A : Volume B
 $\rightarrow 3 : 4$

Volume of A = $25\text{cm} \times 12\text{cm} \times 21\text{cm}$
 $= 6300\text{cm}^3$

7units $\rightarrow 6300\text{cm}^3$
 1 unit $\rightarrow 900\text{cm}^3$
 3 units $\rightarrow 2700\text{cm}^3$
 Height = $\frac{2700\text{cm}^3}{25\text{cm} \times 12\text{cm}} = 9\text{cm}$

Qn 5
 3 units $\rightarrow 24\text{cm}$
 1 unit $\rightarrow 8\text{cm}$

Base area of container B = $\frac{160\text{cm}^3}{8\text{cm}} = 20\text{cm}^2$



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