

Greendale
PRIMARY SCHOOL

P5/P6 Math Parent's Webinar

16 FEBRUARY 2023

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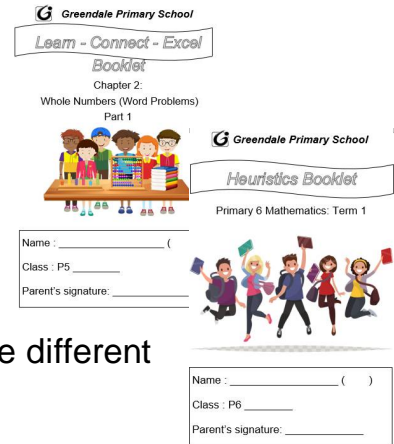
Overview

- ❖ School-based support for students' learning
- ❖ Polya's 4 Steps Problem Solving
- ❖ Format of Mathematics Paper
- ❖ Approved Calculators
- ❖ Assessment Objectives

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School-based Support

- ❖ Textbook and Workbook
- ❖ L-C-E (Learn-Connect-Excel) booklet
 - ❖ reinforce mathematical concepts
 - ❖ expose to different model drawings
- ❖ Heuristics booklet
 - ❖ expose and guide students' learning on the different heuristics/strategies



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Polya's 4 Steps Problem Solving

1. Understand

- Identify (Keywords/Topic)
- Interpret (Re-state the Information)
- Infer (Uncover hidden information)

3. Do

- Model / Heuristic
- Equation
- Working
- Answer

2. Plan

- Choose a Strategy
- Model Drawing (Key approach)
 - Heuristic (Progressive learning across the levels)

4. Check

- Is my Solution Reasonable?
Check the following:
- Number
 - Units
 - Transfer
 - Calculation

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Format of Mathematics Paper (Standard)

Paper	Booklet	Item Type	Number of questions	Number of marks per question	Total	Duration
1 (Calculators are not allowed)	A	Multiple-choice	10	1	10	1 h
			5	2	10	
	B	Short-answer	5	1	5	
			10	2	20	
2 (Calculators are allowed)	-	Short-answer	5	2	10	1 h 30 min
		Structured/Long-answer	12	3, 4 or 5	45	
Total			47	-	100	2 h 30 min

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Format of Mathematics Paper (Foundation)

Paper	Booklet	Item Type	Number of questions	Number of marks per question	Total	Duration
1 (Calculators are not allowed)	A	Multiple-choice	10	1	10	1 h
			10	2	20	
	B	Short-answer	10	2	20	
2 (Calculators are allowed)	-	Short-answer	10	2	20	1 h
		Structured	6	3 or 4	20	
Total			46	-	90	2 h

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Approved Scientific Calculators

S/N	Calculator Brand	Calculator Model	Approved Period ¹
1	CASIO	FX 82MS	2003 – 2026
2		FX 85MS	2003 – 2026
3		FX 95MS	2003 – 2026
4		FX 96SG Plus	2013 – 2025
5		FX 97SG X	2018 – 2026
6		FX 350MS	2003 – 2026
7	CANON	F-960SG	2017 – 2026
8	SHARP	EL W531S	2010 – 2023
9		EL W531S II	2018 – 2026
10		EL W531S II Silver Edition	2021 – 2025
11		EL W531XM	2014 – 2023
12		EL 533X	2013 – 2024

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Assessment Objectives

Cognitive Levels	Standard Math
AO1	recall mathematical facts, concepts, rules and formulae; perform straightforward computations and algebraic procedures
AO2	interpret information; understand and apply mathematical concepts and skills in a variety of contexts
AO3	reason mathematically; analyse information and make inferences; select appropriate strategies to solve problems

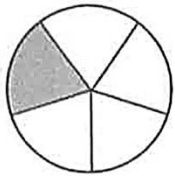
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AO1 Example 1

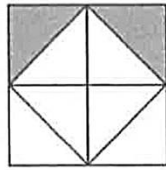
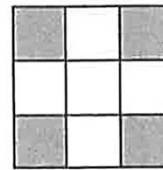
P3 Fractions

PSLE 2022
Paper 1: Booklet A
Q4 (1m)

Which of the following shows $\frac{1}{4}$ of the figure shaded?

(1) $\frac{1}{5}$ 

(2)

(3) $\frac{2}{8}$ (4) $\frac{4}{9}$

$$\frac{2}{8} = \frac{1}{4}$$

Concept Tested:

- Fraction as equal parts in a whole
- Equivalent fractions

Ans: (3)

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AO1 Example 2

P6 Area and Circumference of Circle

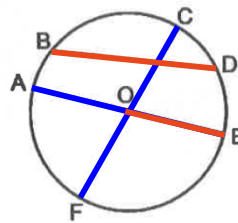
PSLE 2021
Paper 1: Booklet A
Q7 (1m)

The circle has centre O.

AOE and COF are straight lines.

Which pair of lines show its radius and diameter?

	<u>Radius</u>	<u>Diameter</u>
(1)	AE	OC
(2)	AO	BD
(3)	BD	AE
(4)	OE	FC

**Concepts Tested:**

- Radius and diameter of a circle
- Centre of circle

Ans: (4)

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AO1 Example 3

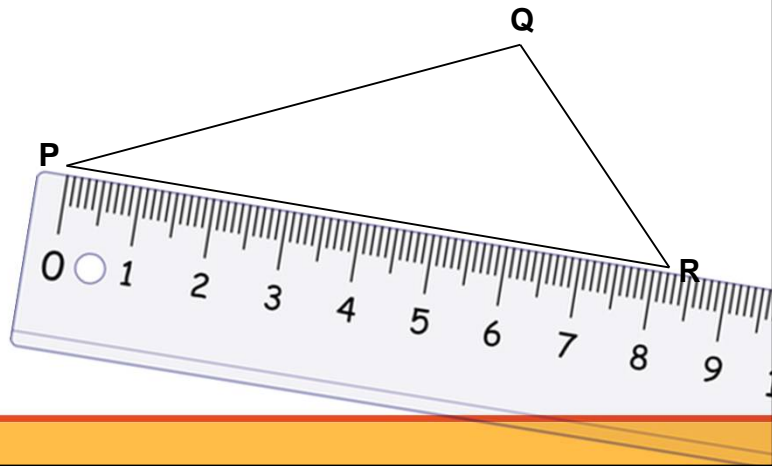
P4 Angles

PSLE 2020
Paper 1: Booklet B
Q24 (2m)

Measure and write down

- (a) the length of PR to the nearest 0.1 cm.
(b) the size of $\angle PQR$.

(a) Ans: 8.2 cm



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AO1 Example 3

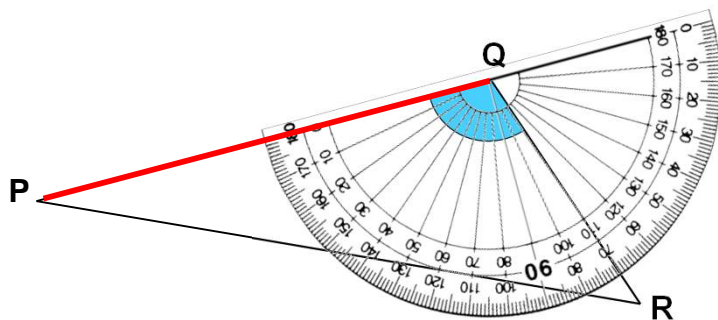
P4 Angles

PSLE 2020
Paper 1: Booklet B
Q24 (2m)

Measure and write down

- (a) the length of PR to the nearest 0.1 cm.
(b) the size of $\angle PQR$.

(b) Ans: 110°



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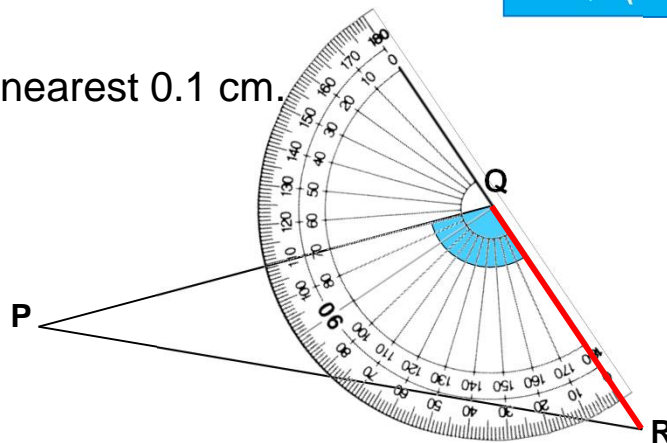
AO1 Example 3

P4 Angles

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 (b) the size of $\angle PQR$.



(b) Ans: 110°

13

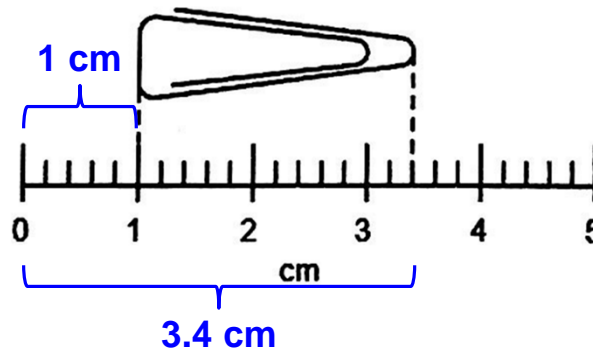
AO1 Example 4

P2 Length

PSLE 2018
Paper 1: Booklet A
Q3 (1m)

What is the length of the paper clip?

- (1) 2.2 cm
 (2) 2.4 cm
 (3) 3.2 cm
 (4) 3.4 cm



Ans: (2)

$$3.4 \text{ cm} - 1 \text{ cm} = 2.4 \text{ cm}$$

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AO2 Example 1

P5 Area of Triangle

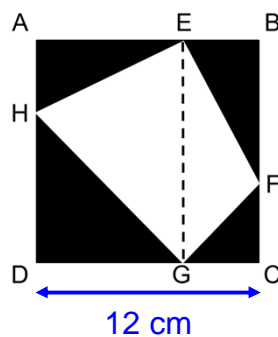
PSLE 2019
Paper 1: Booklet B
Q29 (2m)

ABCD is a square of side 12 cm.

It is formed from two rectangles AEGD and EBCG.

H is a point on AD and F is a point on BC.

Find the area of EFGH.



$$12 \text{ cm} \times 12 \text{ cm} = 144 \text{ cm}^2 \text{ (total area)}$$

$$144 \text{ cm}^2 \div 2 = 72 \text{ cm}^2$$

Ans: 72 cm²

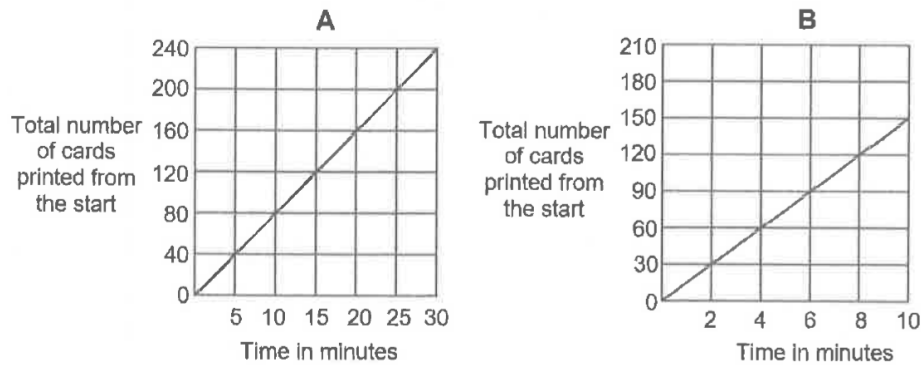
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AO2 Example 2

P4 Line Graph / P5 Rate

PSLE 2021
Paper 2
Q5 (2m)

The graph shows the total number of cards machines A and B printed from the start. Both machines started printing at the same time.



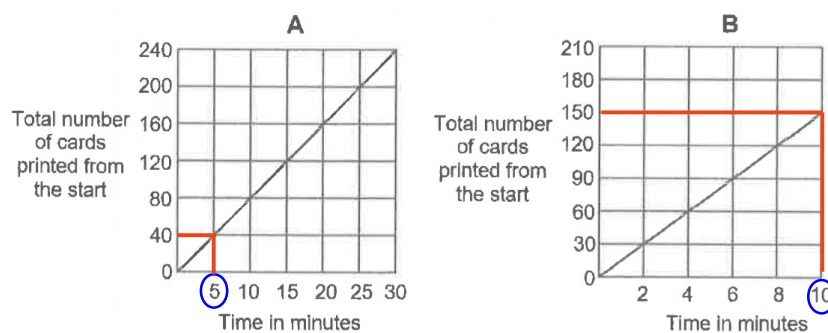
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AO2 Example 2

P4 Line Graph / P5 Rate

PSLE 2021
Paper 2
Q5 (2m)

(a) How many more cards did B print than A in 5 minutes?

A at 5 minutes \rightarrow 40 cardsB at 10 minutes \rightarrow 150 cardsB at 5 minutes $\rightarrow 150 \div 2 = 75$

$$75 - 40 = 35$$

Ans: 35

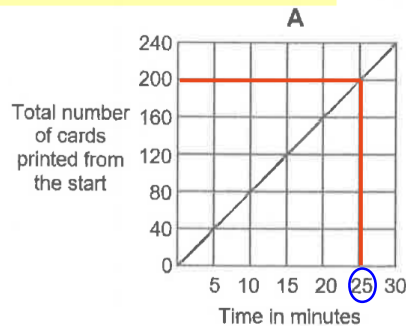
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AO2 Example 2

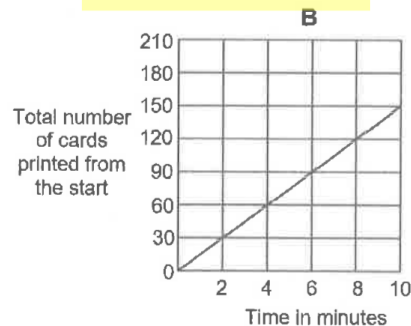
P4 Line Graph / P5 Rate

PSLE 2021
Paper 2
Q5 (2m)

(b) Both machines did not change their rates of printing throughout.
When A had printed 200 cards, how many cards had B printed?



A at 25 minutes → 200 cards



B at 5 minutes → 75 cards,
B at 25 minutes → $75 \times 5 = \underline{375}$

Ans: 375

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AO2 Example 3

Heuristics: Look for Pattern

PSLE 2022
Paper 1: Booklet B
Q29 (2m)

A pattern is formed using the letters A, B and C.
The first 15 letters are shown.



The letter A appears 137 times in the pattern. What is the greatest possible number of letters in the pattern?

In 1 group → 3 As $137 \div 3 = 45 \text{ R} \underline{2}$ (a total of 45 groups with remainder of 2 As)

Since 1 group has 5 letters,

$$(45 \times 5) + \underline{4} = 229$$

Since there is a remainder of 2 As, the greatest possible number of letters will be 4.
→ A , B , A , C

Ans: 229

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AO2 Example 4

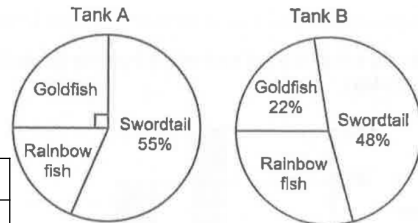
P5 Percentage / P6 Pie Chart

PSLE 2022
Paper 2: Q4 (2m)

The pie charts show the number of each type of fish in two fish tanks, A and B. The total number of fish in Tank A is twice the total number of fish in Tank B.

Each statement is either true, false or not possible to tell from the information given. Put a tick (✓) to indicate your answer.

Statement	True	False	Not possible to tell
There are 55 swordtails in Tank A.			
$\frac{1}{3}$ of the fish in Tank B are rainbow fish.			
There are more rainbow fish in Tank A than in Tank B.			



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AO2 Example 4

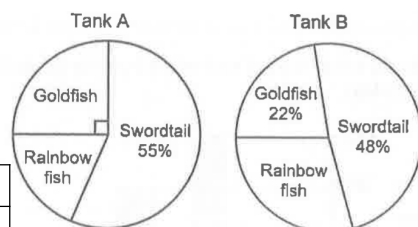
P5 Percentage / P6 Pie Chart

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Each statement is either true, false or not possible to tell from the information given. Put a tick (✓) to indicate your answer.

Statement	True	False	Not possible to tell
There are 55 swordtails in Tank A.			✓

**Statement 1:**

No information is given on the actual number of fish for any category. The only data given is the percentage of swordtail, which is 55%.

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AO2 Example 4

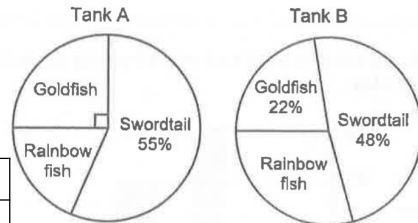
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Statement	True	False	Not possible to tell
$\frac{1}{3}$ of the fish in Tank B are rainbow fish.		✓	

**Statement 2:**

100% – 48% – 22% = 30%
(Rainbow Fish in Tank B)

$$\frac{1}{3} \text{ of } 100\% = 33\frac{1}{3}\%$$

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AO2 Example 4

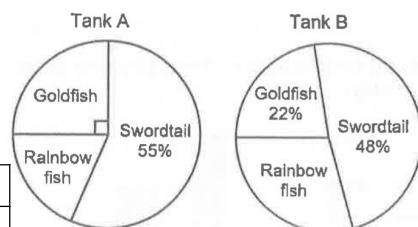
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Each statement is either true, false or not possible to tell from the information given. Put a tick (✓) to indicate your answer.

Statement	True	False	Not possible to tell
There are more rainbow fish in Tank A than in Tank B.	✓		

**Statement 3:**

25% (Goldfish in Tank A)
100% – 25% – 55% = 20% (Rainbow Fish in Tank A)
100% – 22% – 48% = 30% (Rainbow Fish in Tank B)

	Example 1	Example 2
Tank A	20% of 100 = 20	20% of 120 = 24
Tank B	30% of 50 = 15	30% of 60 = 18

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AO3 Example 1

P5 Whole Number

PSLE 2020
Paper 1: Booklet B
Q27 (2m)

The table shows the number of storybooks read by each pupil in a group. Part of the table is covered by an ink blot.

There were 45 pupils who read at least 2 storybooks.

Number of storybooks	0	1	2	3	4
Number of pupils	7	8	20		

Each statement is either true, false or not possible to tell from the information given.

Put a tick (✓) to indicate your answer.

Statement	True	False	Not Possible To Tell
7 pupils did not read any storybooks.			
There were 80 pupils in the group.			
The number of pupils who read 3 storybooks was equal to the number of pupils who read 4 storybooks.			

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AO3 Example 1

P5 Whole Number

PSLE 2020
Paper 1: Booklet B
Q27 (2m)

The table shows the number of storybooks read by each pupil in a group. Part of the table is covered by an ink blot.

There were 45 pupils who read at least 2 storybooks.

Number of storybooks	0	1	2	3	4
Number of pupils	7	8	20		

Each statement is either true, false or not possible to tell from the information given.

Put a tick (✓) to indicate your answer.

Statement	True	False	Not Possible To Tell
7 pupils did not read any storybooks.	✓		

Statement 1:

Based on the given table, it is clearly shown that 7 pupils did not read any storybook.

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AO3 Example 1

P5 Whole Number

PSLE 2020
Paper 1: Booklet B
Q27 (2m)

The table shows the number of storybooks read by each pupil in a group. Part of the table is covered by an ink blot.

There were 45 pupils who read at least 2 storybooks.

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Number of pupils	7	8	20		

Each statement is either true, false or not possible to tell from the information given.

Put a tick (✓) to indicate your answer.

Statement	True	False	Not Possible To Tell
There were 80 pupils in the group.		✓	

Statement 2:

Since 45 pupils read at least 2 storybooks, the total number of pupils is $\rightarrow 7 + 8 + 45 = 60$

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AO3 Example 1**P5 Whole Number**

PSLE 2020
Paper 1: Booklet B
Q27 (2m)

The table shows the number of storybooks read by each pupil in a group. Part of the table is covered by an ink blot.

There were 45 pupils who read at least 2 storybooks.

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Number of pupils	7	8	20		

Each statement is either true, false or not possible to tell from the information given.

Put a tick (✓) to indicate your answer.

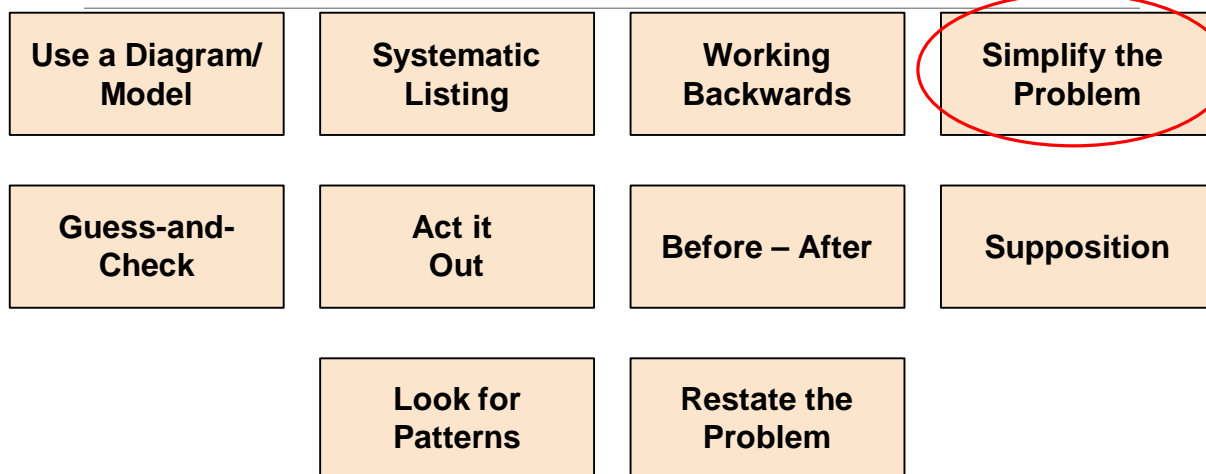
Statement	True	False	Not Possible To Tell
The number of pupils who read 3 storybooks was equal to the number of pupils who read 4 storybooks.		✓	

Statement 3:

Since 45 pupils read at least 2 storybooks, the total number of pupils who read 3 and 4 storybooks → $45 - 20 = 25$ (odd number)

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Heuristics-based Questions



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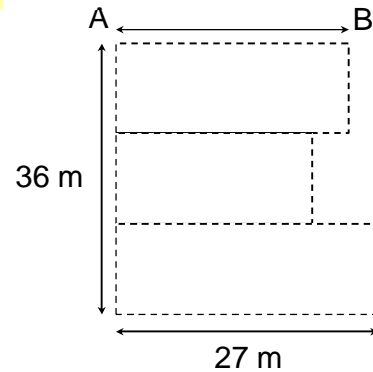
AO3 Example 2

P5 Area and Perimeter

PSLE 2022
Paper 2: Q16 (5m)

A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

- (a) Find the length of AB. [2]
 (b) Find the perimeter of the plot of land. [3]



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AO3 Example 2

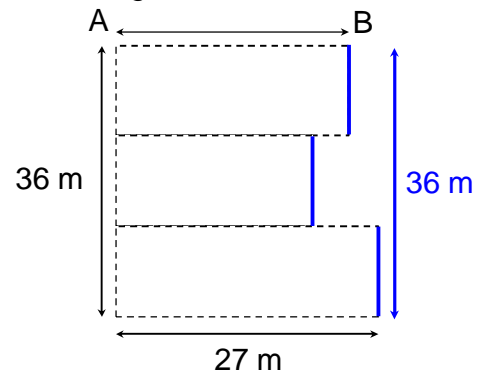
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A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

- (a) Find the length of AB. [2]

Given that the vertical lengths are the same at both sides, the length at the opposite side is also equal to 36 m .



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AO3 Example 2**P5 Area and Perimeter**PSLE 2022
Paper 2: Q16 (5m)

A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(a) Find the length of AB. [2]

We would need to first identify the part of the fields that are fenced up.

$$36 \text{ m} + 36 \text{ m} + 27 \text{ m} + 27 \text{ m} + AB + AB = 177 \text{ m}$$

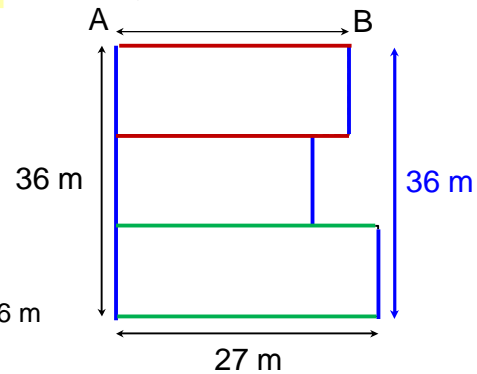
$$126 \text{ m} + 2AB = 177 \text{ m}$$

$$2AB = 177 \text{ m} - 126 \text{ m}$$

$$= 51 \text{ m}$$

$$\text{Therefore, } AB = 51 \text{ m} \div 2$$

$$= \underline{25.5 \text{ m}}$$

**Ans: 25.5 m**

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Heuristics-based Questions

Use a Diagram/
ModelSystematic
ListingWorking
BackwardsSimplify the
ProblemGuess-and-
CheckAct it
Out

Before – After

Supposition

Look for
PatternsRestate the
Problem

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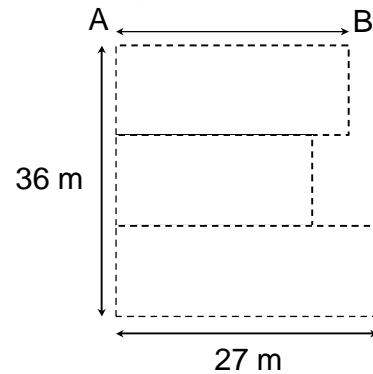
AO3 Example 2

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AO3 Example 2

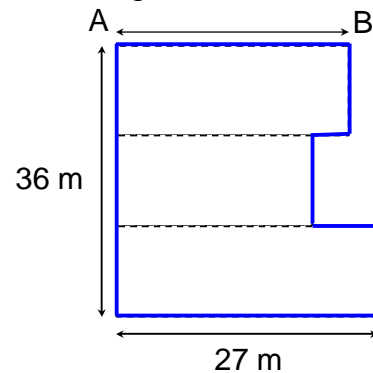
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PSLE 2022
Paper 2: Q16 (5m)

A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

Perimeter of the plot of land refers to the highlighted parts in figure.



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AO3 Example 2

P5 Area and Perimeter

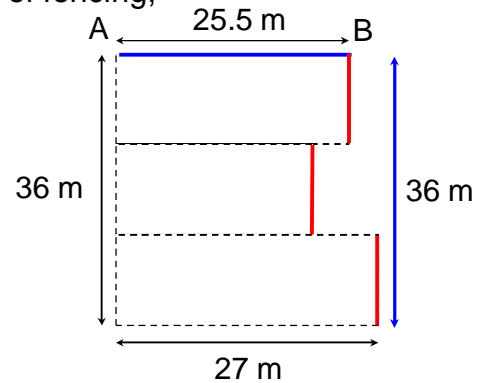
PSLE 2022
Paper 2: Q16 (5m)

A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

Perimeter of the plot of land refers to the highlighted parts in figure.

$$36 \text{ m} \div 3 = 12 \text{ m}$$



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AO3 Example 2

P5 Area and Perimeter

PSLE 2022
Paper 2: Q16 (5m)

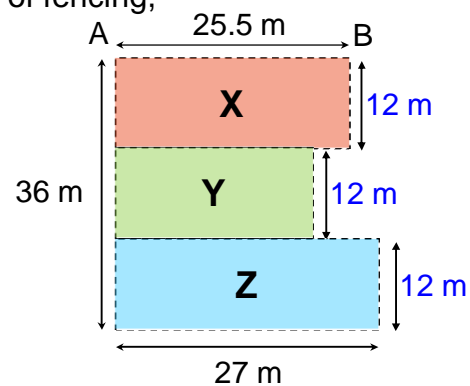
A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

Perimeter of the plot of land refers to the highlighted parts in figure.

$$36 \text{ m} \div 3 = 12 \text{ m}$$

Label rectangles as rectangles X, Y and Z.



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AO3 Example 2

P5 Area and Perimeter

PSLE 2022
Paper 2: Q16 (5m)

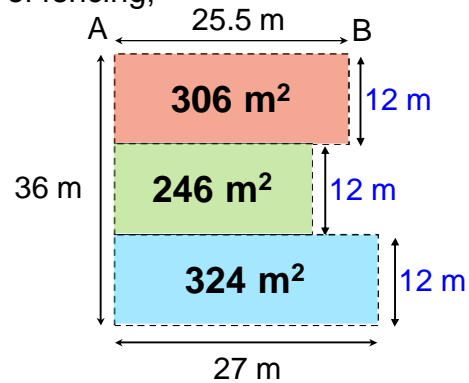
A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

$$\begin{aligned} \text{Area of rectangle X} &= 25.5 \text{ m} \times 12 \text{ m} \\ &= 306 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of rectangle Z} &= 27 \text{ m} \times 12 \text{ m} \\ &= 324 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of rectangle Y} &= 876 \text{ m}^2 - 306 \text{ m}^2 - 324 \text{ m}^2 \\ &= 246 \text{ m}^2 \end{aligned}$$



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AO3 Example 2

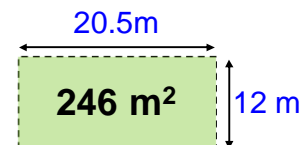
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PSLE 2022
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A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

$$\begin{aligned} \text{Length of rectangle Y} &= 246 \text{ m}^2 \div 12 \text{ m} \\ &= 20.5 \text{ m} \end{aligned}$$



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AO3 Example 2

P5 Area and Perimeter

PSLE 2022
Paper 2: Q16 (5m)

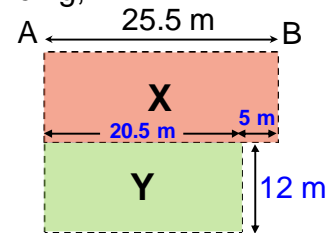
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(b) Find the perimeter of the plot of land. [3]

$$\begin{aligned} \text{Length of rectangle Y} &= 246 \text{ m}^2 \div 12 \text{ m} \\ &= 20.5 \text{ m} \end{aligned}$$

Difference in length between rectangle X and Y

$$\begin{aligned} \text{Length of rectangle X} - \text{Length of rectangle Y} \\ &= 25.5 \text{ m} - 20.5 \text{ m} \\ &= 5 \text{ m} \end{aligned}$$



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AO3 Example 2

P5 Area and Perimeter

PSLE 2022
Paper 2: Q16 (5m)

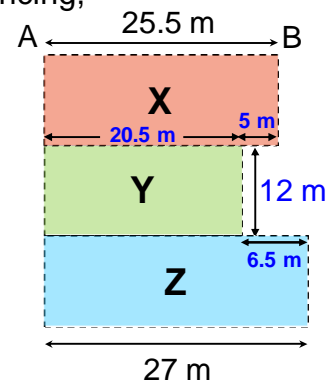
A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

$$\begin{aligned} \text{Length of rectangle Y} &= 246 \text{ m}^2 \div 12 \text{ m} \\ &= 20.5 \text{ m} \end{aligned}$$

Difference in length between rectangle Z and Y

$$\begin{aligned} \text{Length of rectangle Z} - \text{Length of rectangle Y} \\ &= 27 \text{ m} - 20.5 \text{ m} \\ &= 6.5 \text{ m} \end{aligned}$$



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AO3 Example 2

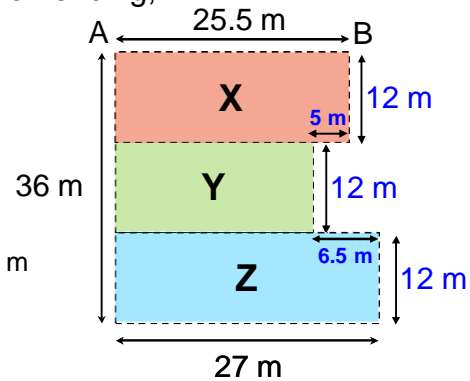
P5 Area and Perimeter

PSLE 2022
Paper 2: Q16 (5m)

A plot of land of area 876 m^2 is divided into three rectangular fields of equal width. The fields are fenced using 177 m of fencing, indicated by ----- in the figure below.

(b) Find the perimeter of the plot of land. [3]

$$\begin{aligned} \text{Perimeter of land} &= 36 \text{ m} + 25.5 \text{ m} + 12 \text{ m} + 5 \text{ m} + 12 \text{ m} + 6.5 \text{ m} + 12 \text{ m} + 27 \text{ m} \\ &= \underline{\underline{136 \text{ m}}} \end{aligned}$$



Ans: 136 m

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Heuristics-based Questions

Use a Diagram/
Model

Systematic
Listing

Working
Backwards

Simplify the
Problem

Guess-and-
Check

Act it
Out

Before – After

Supposition

Look for
Patterns

Restate the
Problem

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AO3 Example 3

P5 Volume

PSLE 2022
Paper 2
Q13 (4m)

Lily has identical building blocks. Each block has a square base and a height, h cm as shown in Figure 1.

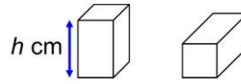


Figure 1

She uses these blocks to build two towers, A and B, as shown in Figure 2.

The height of A is 58 cm, and the height of B is 94 cm as shown in Figure 3.

- (a) What is the height, h of each block? [2]

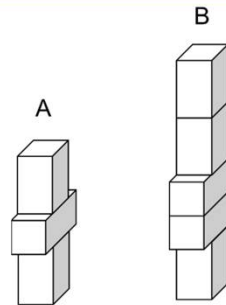


Figure 2

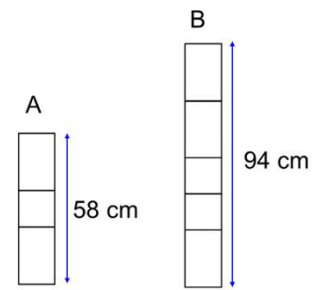


Figure 3

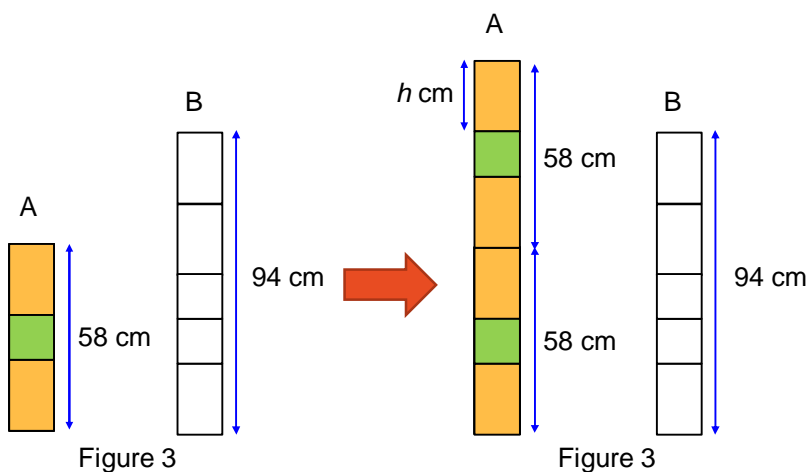
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AO3 Example 3

P5 Volume

PSLE 2022
Paper 2
Q13 (4m)

- (a) What is the height, h of each block? [2]



$$58 \text{ cm} + 58 \text{ cm} = 116 \text{ cm}$$

$$h = 116 \text{ cm} - 94 \text{ cm}$$

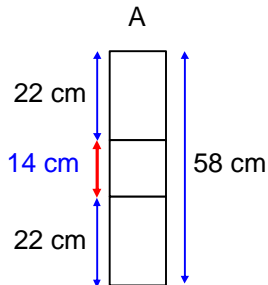
$$= 22 \text{ cm}$$

Ans: 22 cm

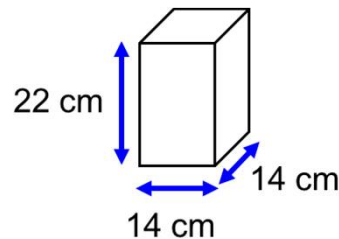
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AO3 Example 3**P5 Volume**PSLE 2022
Paper 2
Q13 (4m)

(b) What is the volume of each block? [2]



$$58 \text{ cm} - 22 \text{ cm} - 22 \text{ cm} = 14 \text{ cm}$$



$$\begin{aligned} \text{Volume} &= \text{Length} \times \text{Base} \times \text{Height} \\ &= 14 \text{ cm} \times 14 \text{ cm} \times 22 \text{ cm} \\ &= \mathbf{4312 \text{ cm}^3} \end{aligned}$$

Ans: 4312 cm³

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AO3 Example 4**Heuristics: Number x Value**PSLE 2022
Paper 2
Q17 (4m)

Mrs Li baked a total of 40 large and small cakes in the ratio 5 : 3. She decorated them with cherries. The number of cherries used for each large and small cake was in the ratio 3 : 2. She used 204 cherries to decorate all the small cakes and 7 large cakes.

- (a) How many small cakes did Mrs Li bake? [1]
 (b) How many cherries did Mrs Li use for all the small cakes? [2]
 (c) How many more cherries did Mrs Li need for the remaining large cakes? [1]

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AO3 Example 4**Heuristics: Number x Value**PSLE 2022
Paper 2
Q17 (4m)

Mrs Li baked a total of 40 large and small cakes in the ratio 5 : 3. She decorated them with cherries. The number of cherries used for each large and small cake was in the ratio 3 : 2. She used 204 cherries to decorate all the small cakes and 7 large cakes.

(a) How many small cakes did Mrs Li bake? [1]

$$8 \text{ units} = 40$$

$$\begin{aligned} 1 \text{ unit} &= 40 \div 8 \\ &= 5 \end{aligned}$$

$$\begin{aligned} 3 \text{ units} &= 5 \times 3 \\ &= \underline{15} \end{aligned}$$

Ans: 15

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AO3 Example 4**Heuristics: Number x Value**PSLE 2022
Paper 2
Q17 (4m)

Mrs Li baked a total of 40 large and small cakes in the ratio 5 : 3. She decorated them with cherries. The number of cherries used for each large and small cake was in the ratio 3 : 2. She used 204 cherries to decorate all the small cakes and 7 large cakes.

(b) How many cherries did Mrs Li use for all the small cakes? [2]

Number of small cakes: 15 [answer from (a)]

$$\underbrace{(3u \times 7)}_{\text{Large}} + \underbrace{(2u \times 15)}_{\text{Small}} = 51 \text{ units}$$

$$51 \text{ units} = 204$$

$$1 \text{ unit} = 204 \div 51$$

$$= 4 \text{ (number of cherries)}$$

$$30 \text{ units} = 4 \times 30$$

$$= \underline{120}$$

Ans: 120

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AO3 Example 4**Heuristics: Number x Value**

PSLE 2022
Paper 2
Q17 (4m)

Mrs Li baked a total of 40 large and small cakes in the ratio 5 : 3. She decorated them with cherries. The number of cherries used for each large and small cake was in the ratio 3 : 2. She used 204 cherries to decorate all the small cakes and 7 large cakes.

(c) How many more cherries did Mrs Li need for the remaining large cakes? [1]

$$40 - 15 = 25 \text{ (number of large cakes)}$$

$$25 - 7 = 18 \text{ (remaining number of large cakes)}$$

$$1 \text{ large cake} \rightarrow 4 \times 3 = 12 \text{ (number of cherries on one large cake)}$$

$$18 \times 12 = \underline{216}$$

Ans: 216

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