



SIR WILLIAM PERKINS'S SCHOOL

Year 7 Mathematics Entrance Examination

Sample Paper

September 2026 Intake

Instructions for Candidates:

- Answer all questions in the spaces provided on the paper.
- This paper is divided into two parts:
Part 1 – General Skills
Part 2 – Problem Solving
- You have **1 hour** to complete the paper.
Try to spend about **30 minutes on each part**.
- Show all your working clearly, as **marks may be awarded for your methods**.
- If you find a question too difficult, leave it and move on to the next one.
You can come back to it later if you have time.

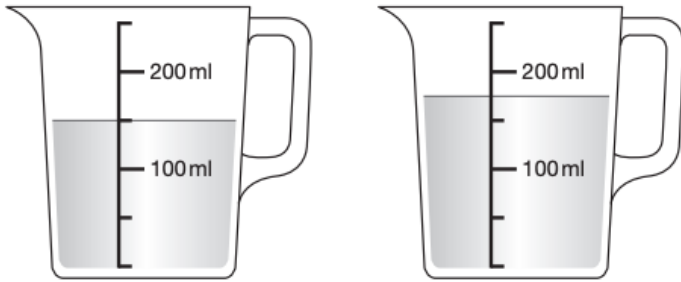
Name:

School:

Problem Solving

Question 1

Stefan has 600 millilitres of water in a bottle.
He pours some of the water into two measuring jugs as shown.

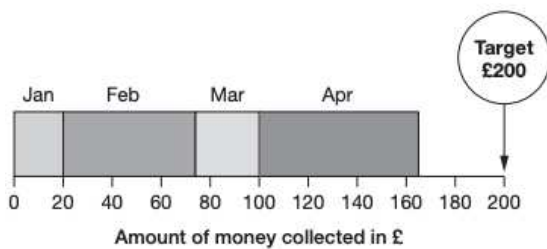


How many millilitres of water are left in Stefan's bottle?

..... ml

Question 2

A school plans to collect £200 between January and May.
This chart shows how much they collected by the end of April.

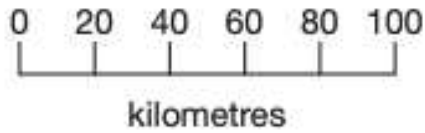


How much money did they collect in February and March **altogether**?

£

Question 3

On a map, 1 cm represents 20 km.



The distance between two cities is **250 km**.

On the map, what is the distance between the two cities?

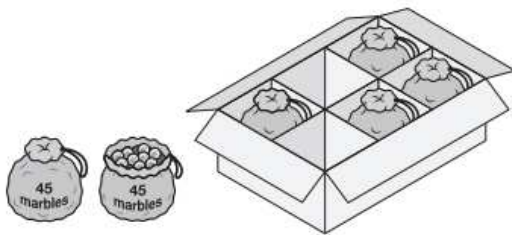
..... cm

Question 4

A toy shop orders 11 boxes of marbles.

Each box contains 6 bags of marbles.

Each bag contains 45 marbles.



How many **marbles** does the shop order in total?

.....

Question 5



The table shows the cost of coach tickets to different cities.

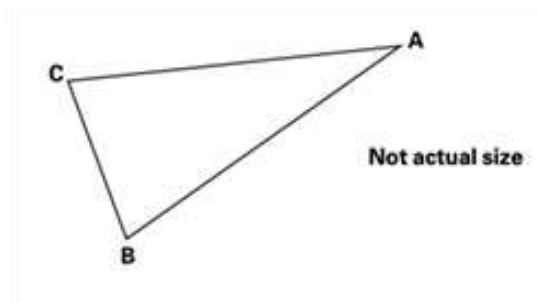
	Hull	York	Leeds
Adult Single	£12.50	£15.60	£10.25
Adult Return	£23.75	£28.50	£19.30
Child Single	£8.50	£10.80	£8.25
Child Return	£14.90	£17.90	£14.75

How much **more** does it cost for two adults to make a **single** journey to Hull than to Leeds?

£

Question 6

Triangle **ABC** is isosceles and has a perimeter of 20 centimetres.
Side **AB** and **AC** are each twice as long as **BC**.

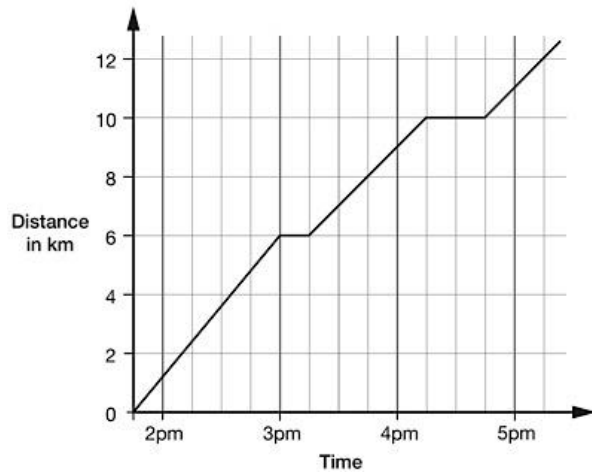


Calculate the length of the side **BC**. Do not use a ruler.

..... cm

Question 7

This graph shows the distance Alfie and Chen walked in an afternoon. They started at 1:45pm and had two breaks.



How many kilometres did they walk **between** the first and second breaks?

..... km

Question 8

Adam chooses the colours for a new team shirt.
The shirt has two colours.



There are four colours to choose from: yellow, blue, white and red.
Write the two missing combinations.

The shirt could be:

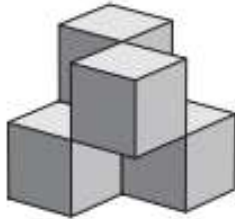
- yellow and blue
- yellow and white
- yellow and red
- blue and white.

.....

.....

Question 9

The diagram shows a shape made from four $3\text{ cm} \times 3\text{ cm} \times 3\text{ cm}$ wooden cubes joined by their edges.

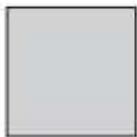


What, in cm^2 , is the surface area of the shape?

..... cm^2

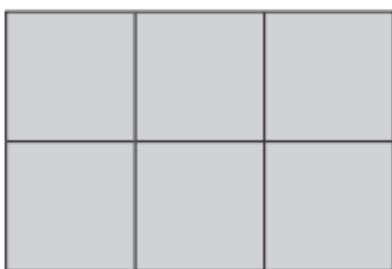
Question 10

The diagram shows a square with a **perimeter** of 12 cm.



Not drawn accurately

Six of these squares fit together to make a rectangle.



Not drawn accurately

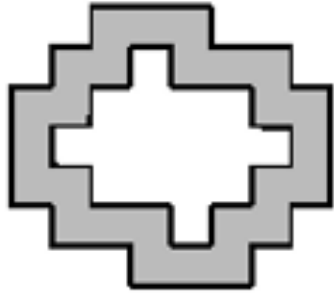
What is the **area** of the **rectangle**?

..... cm^2

Question 11

In the diagram shown, all the angles are right angles and all the sides are of length 1 unit, 2 units or 3 units.

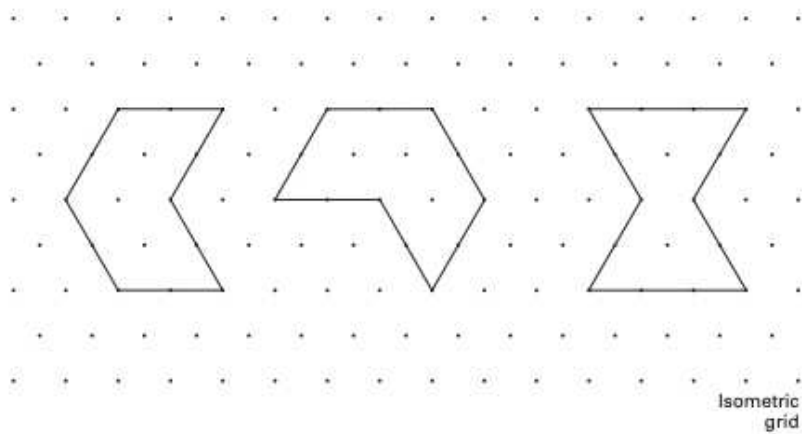
What, in square units, is the area of the shaded region?



..... *units*²

Question 12

Look at these shapes.

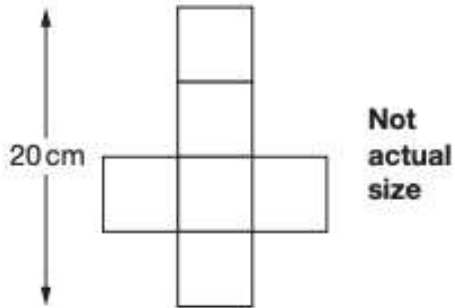


Explain why the shapes are **hexagons**.

.....

Question 13

This is the net of a cube.



What is the **volume** of the cube?

..... cm³

Question 14

Here are the ingredients for a cordial used to make a drink.

- | |
|---------------------|
| 50g ginger |
| 1 lemon |
| 1.5 litres of water |
| 900g sugar |

The finished drink should be 1 part cordial and 2 parts water.

Jenny puts 100ml of cordial in a glass.

How much water should she put with it?

..... ml

Question 15

In this subtraction, P, Q, R, S and T represent single digits.

What is the value of $P + Q + R + S + T$?

$$\begin{array}{r} 7 \quad Q \quad 2 \quad S \quad T \\ - P \quad 3 \quad R \quad 9 \quad 6 \\ \hline 2 \quad 2 \quad 2 \quad 2 \quad 2 \end{array}$$

.....

Question 16

Each of these bags contains **£1.60**.

Each bag contains only one type of coin.



Complete this table to show how many coins are in each bag.

One has been done for you.

Type of coin	Number of coins
1p	160
10p	<input type="text"/>
20p	<input type="text"/>

Question 17



15% of the people walk 5 km or less.
40% of the people walk 8 km or more.
What percentage of the people walk between 5 km and 8 km?

..... %

Question 18

One day, each driver entering a car park paid exactly £1.50



Here is what was put into the machine that day:

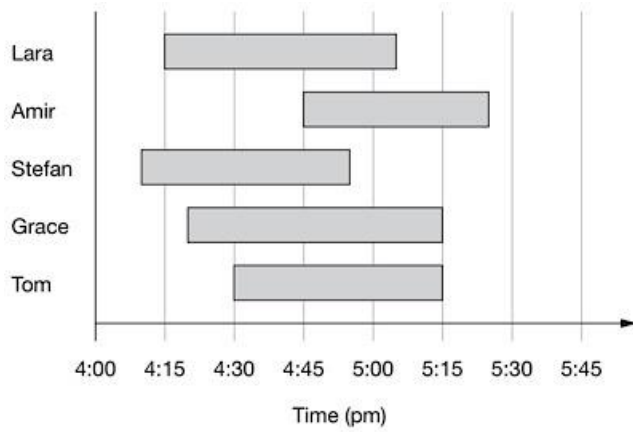
Number of £1 coins	136
Number of 50p coins	208

On that day, what percentage of drivers paid with **three 50p coins**?

..... %

Question 19

This chart shows the times when 5 children were at a swimming pool one afternoon.

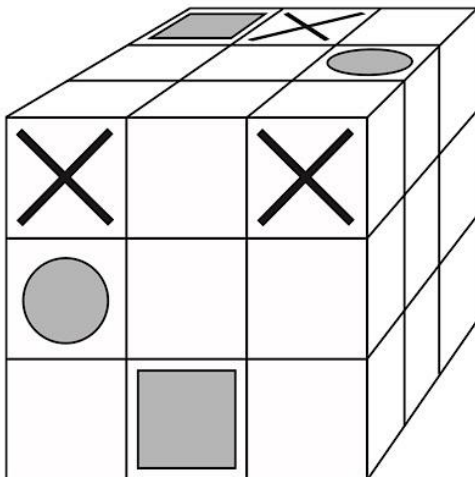


Who was the next person to arrive after Stefan?

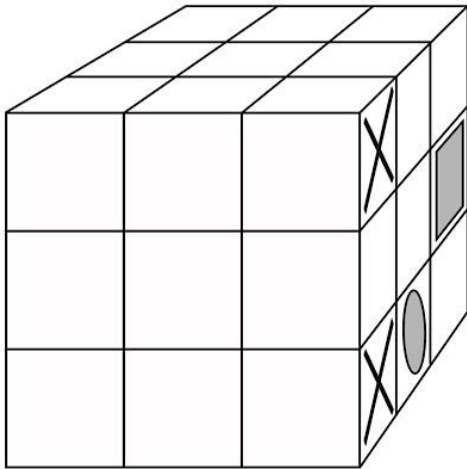
.....

Question 20

Cubes have been stuck together to make this block.
The block has a pattern on two faces.



The block is turned to the position below.
 Draw the missing parts of the pattern on it.

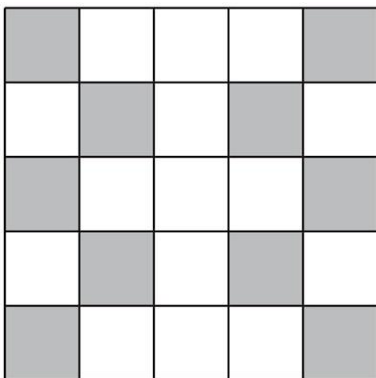


Each box below represents a section on the face of the cube. Write either Blank, Circle, Cross or Square in each box. One has been done for you.

Blank		

Question 21

Here is a pattern on a grid.



What **percentage** of the grid is shaded?

..... %

Question 22

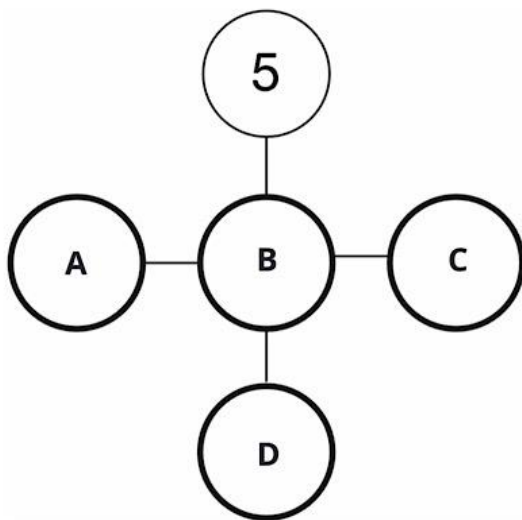
Here are five number discs.



Look at the cross pattern below.

Use each disc **once** so that the total across and the total down is 13.

One has been done for you.



****A is less than C****

- A
- B
- C
- D

Mark scheme

Question 1

275ml

Question 2

£80

Question 3

12.5cm

Question 4

2970

Question 5

£4.50

14b	£4.50	1m	Accept £4.50p OR £4.50 Do not accept £450 OR £450p OR £4.5 <i>If the final '0' is missing from both answers, ie answers given are £64.3 and £4.5 respectively, award ONE mark only in 14b.</i>
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Question 6

4cm

21	Award TWO marks for the correct answer of 4cm. If the answer is incorrect award ONE mark for evidence of appropriate working, eg $1 + 2 + 2 = 5$ $20 \div 5 = \text{wrong answer}$	Up to 2m
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Question 7

4km

17a	4km	1m	
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Question 8

blue and red OR red and blue OR white and red OR red and white

red and white OR blue and red OR red and blue OR white and red

Question 9

216cm²

Each of the cubes has six faces all of which are exposed. Therefore the four cubes have a total of 24 faces. Each face measures 3 cm by 3 cm and so has an area of 9 cm². Therefore the surface area of the shape is $(24 \times 9) \text{ cm}^2 = 216 \text{ cm}^2$.

Question 10

54cm²

1m	Gives a correct value for the area of the rectangle eg ▪ 54 ▪ 5400
U1	
1m	Shows the correct unit for their area eg ▪ cm ² [with 54] ▪ mm ² [with 5400]

Question 11

26units²

Divide the whole figure into horizontal strips of height 1 unit: its area is $(3 + 6 + 8 + 8 + 8 + 6 + 3) \text{ units}^2 = 42 \text{ units}^2$. Similarly, the unshaded area is $(1 + 4 + 6 + 4 + 1) \text{ units}^2 = 16 \text{ units}^2$. So the shaded area is 26 units².

Alternative solution: notice that if the inner polygon is moved a little, the answer remains the same – because it is just the difference between the areas of the two polygons. So, although we are not told it, we may assume that the inner one is so positioned that the outer shaded area can be split neatly into 1 by 1 squares – and there are 26 of these.

Question 12

6 sides OR six sides OR six vertices OR six corners

1m || Gives a correct explanation
eg
■ Each shape has six sides
■ They all have six corners
■ 6 sides

Question 13

125cm³

Question 14

200ml

1m || 200

Question 15

29

As $7Q2ST - P3R96 = 22222$, it follows that $7Q2ST = P3R96 + 22222$.
Looking at the units column: $2 + 6 = T$, so $T = 8$. Looking at the tens column, as $2 + 9 = 11$, we deduce that $S = 1$ and that 1 is carried to the hundreds column. Looking at the hundreds column: the carry of 1 + 2 + R must equal 12 since the sum has 2 in the hundreds column. So $R = 9$ and there is a carry of 1 to the thousands column. Looking at this column: the carry of 1 + 2 + 3 = Q , so $Q = 6$. Finally, since there is no carry to the next column, $2 + P = 7$, so $P = 5$. Therefore the calculation is $76218 - 53996 = 22222$ and $P + Q + R + S + T = 5 + 6 + 9 + 1 + 8 = 29$.

Question 16

Type of coin	Number of coins
1p	160
10p	16
20p	8

8	Table completed as shown:	1m	Both numbers must be correct for the award of the mark.								
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Type of coin</th> <th>Number of coins</th> </tr> </thead> <tbody> <tr> <td>1p</td> <td>160</td> </tr> <tr> <td>10p</td> <td>16</td> </tr> <tr> <td>20p</td> <td>8</td> </tr> </tbody> </table>	Type of coin	Number of coins	1p	160	10p	16	20p	8		
Type of coin	Number of coins										
1p	160										
10p	16										
20p	8										

Question 17

45%

10b	45%	1m	
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Question 18

15%

3m	15
<i>or</i>	
2m	Shows the values 24 and 160
	<i>or</i>
	Shows a correct method with not more than one computational or rounding error
	eg
	<ul style="list-style-type: none"> ■ $(208 - 136) \div 3 + (240 \div 1.50)$ ■ $208 - 136 = 72,$ $72 \div 3 = 26$ (<i>error</i>), $26 + 136 = 162$ $26 \div 162 \times 100 = 16.25$
<i>or</i>	
1m	Shows the value 24 or 160
	<i>or</i>
	Shows a correct method with not more than two computational or rounding errors
	eg
	<ul style="list-style-type: none"> ■ $208 - 136 = 62$ (<i>error</i>), $62 \div 3 = 21$ (<i>premature rounding</i>), $21 \div 160 \times 100 = 13.125$

Question 19

Lara

7a	Lara	1m	Accept unambiguous abbreviations or recognisable misspellings.
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Question 20

Blank	Circle	Blank
Cross	Blank	Blank
Square	Blank	Blank

19	<p>Award TWO marks for the diagram completed as shown:</p>  <p>If the answer is incorrect, award ONE mark for two shapes correct and no more than one incorrect.</p>	<p>Up to 2m</p> <p>Accept slight inaccuracies in drawing provided the intention is clear.</p> <p>Circle and square need not be shaded.</p>
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Question 21

40%

21	40%	1m	Do not accept equivalent fractions or decimals.
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Question 22

A3

B1

C9

D7

14	<p>Diagram completed so that totals across and down are both 13 OR both 17, eg:</p> 	<p>1m</p> <p>U1</p>
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