



# GOING FOR GOLD

## Problem Solving

### Silver Paper 2

Q	Topic	My Mark	Maximum Marks
1	Ratio		4
2	Probability		4
3	Polygons		4
4	Area		5
5	Pythagoras		4
6	Forming and solving equations		5
7	Percentages		4
8	Circle		5
9	Exchange rates and proportion		4
10	Volume and surface area		4
			<b>43</b>

### Question 1 - Ratio

At a school

Number of boys: number of girls = 9 : 7

There are 116 **more** boys than girls.

Work out the total number of students at the school.

a) Below a diagram shows the ratio of boys to girls



If there are 116 **more** boys what does this tell you about the number in each of the last two boxes in the diagram above?

(1 mark)

b) Work out the total number of students.

(3 marks)

## Question 2 - Probability

There are some green counters, some yellow counters, some blue counters and some red counters in a bag.

The table shows the probabilities that a counter taken at random from the bag will be green or yellow or red.

Colour	Green	Yellow	Blue	Red
Probability	0.16	0.4		0.24

There are 125 counters in the bag.

Work out the number of blue counters in the bag.

a) What is the probability of a blue counter?

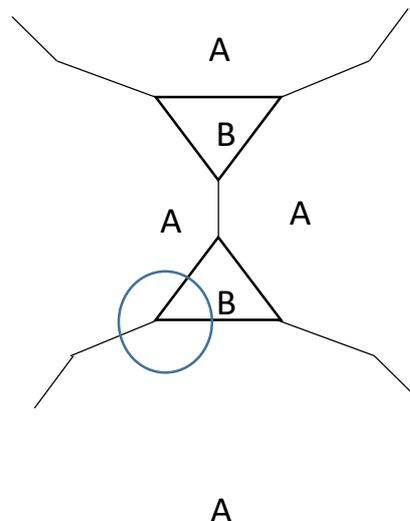
(2 marks)

b) How many blue counters are in the bag of 125 counters?

(2 marks)

### Question 3 - Polygons

The pattern is made from two types of tiles, tile A and tile B.



Both tile A and tile B are regular polygons.

Work out the number of sides tile A has.

- a) What is the internal angle in an equilateral triangle?

(1 mark)

- b) The angle circled is an angle at a point. It has one angle from shape B and two internal angles from shape A. What is the internal angle for shape A?

(1 mark)

- c) What is the external angle shape A?

(1 mark)

- d) How many sides has shape A?

(1 mark)

#### Question 4 - Area

Mr Weaver's garden is in the shape of a rectangle.

In the garden

there is a patio in the shape of a rectangle  
and two ponds in the shape of circles with diameter 3.8 m.

The rest of the garden is grass.

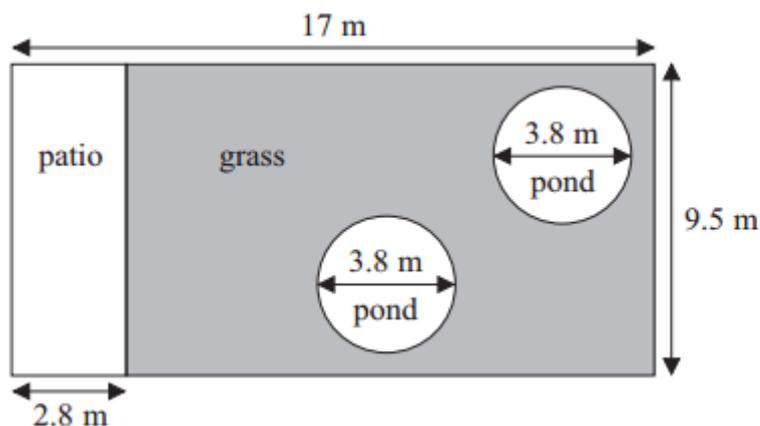


Diagram **NOT**  
accurately drawn

Mr Weaver is going to spread fertiliser over all the grass.

One box of fertiliser will cover  $25 \text{ m}^2$  of grass.

How many boxes of fertiliser does Mr Weaver need?

You must show your working.

- a) Find the area of the whole garden

(1 mark)

- b) Find the area of the patio

(1 mark)

- c) Find the area of the two ponds

(1 mark)

- d) Find the grassed area

(1 mark)

- e) Find the number of boxes of fertiliser required to cover the grassed area

(1 mark)

### Question 5 - Pythagoras

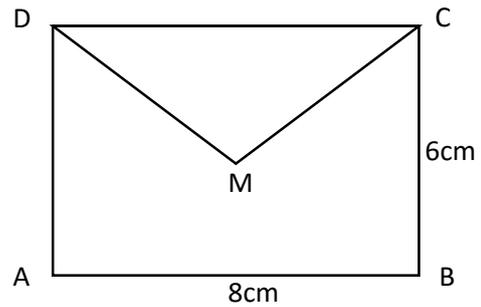
An envelope measures 6cm by 8cm.

The flap meets the envelope at the point M.

The point M is in the exact centre of the envelope.

A glue strip runs from D to M and M to C.

What is the length of the glue strip?



- a) Draw a line from M to the midpoint of BC. Call the point E. Use triangle MCE to find the length of MC.

(3 marks)

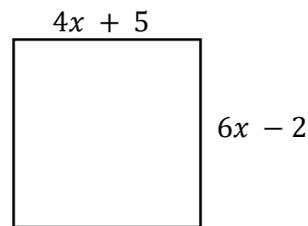
- b) State the length of the glue strip from D to M and M to C.

(1 mark)

**Question 6 - Forming and solving equations**

The diagram shows a square.

All the lengths are measured in centimetres.



*Diagram not  
drawn to scale*

Use an algebraic method to find the length of one side of the square.

a) The shape is a square. Use this information to set up an equation.

(1 mark)

b) Solve the equation.

(2 marks)

c) Use the value of  $x$  from part b) to find the length of side of the square.

(2 marks)

### Question 7 - Percentages

In a company, the ratio of the number of men to the number of women is 3 : 2

40% of the men are under the age of 25

10% of the women are under the age of 25

What percentage of all the people in the company are under the age of 25?

- a) Consider that the company has 100 people. How many of the company are men and how many are women?

(1 mark)

- b) Use your answers to part a) to find the total number of people in the company who are under 25 years of age.

(2 marks)

- c) What percentage of all the people in the company (100 people) are under the age of 25?

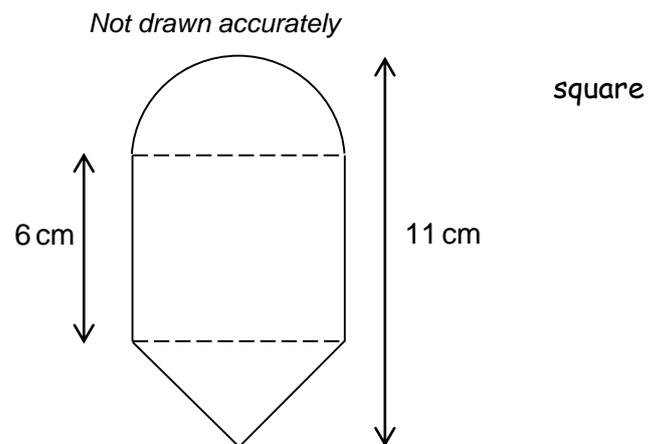
(1 mark)

### Question 8 - Circle

Silver B

A badge is made from an isosceles triangle, a square and a semi-circle.

Work out the area of the badge.



a) Find the area of the square

(1 mark)

b) What is the diameter of the circle? Find the area of the semi-circle.

(2 mark)

c) What is the base and height of the triangle? Find the area of the triangle

(1 mark)

d) Find the total area of the shape.

(1 mark)

### Question 9 - Exchange rates and proportion

Here is a list of ingredients for making 18 mince pies.

<b>Ingredients for 18 mince pies</b>
225 g of butter
350 g of flour
100 g of sugar
280 g of mincemeat
1 egg

Elaine wants to make 45 mince pies.

Elaine has

- 1 kg of butter
- 1 kg of flour
- 500 g of sugar
- 600 g of mincemeat
- 6 eggs

Does Elaine have enough of each ingredient to make 45 mince pies?

You must show clearly how you got your answer.

Suggested method:

Find the multiplier between 18 and 45

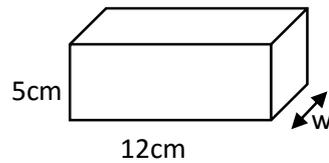
$$18 \longrightarrow \div 2 \longrightarrow \times 9 \longrightarrow 45$$

Use the multiplier method to find the amount of each ingredient required to make 45 mince pies

(4 marks)

### Question 10 - Volume and surface area

This cuboid has a volume of  $360\text{cm}^3$ .



Work out its surface area.

- a) The volume of a cuboid is  $l \times w \times h$ . You are given the length and height and know that the volume is  $360\text{cm}^3$ . Use this information to find the width.

( 1mark)

- b) The surface area is the total area of the six faces of the cuboid. Find the area of each face and then find the surface area (total of all six faces)

(3 marks)