| Name ANSWERS | Class |
|---|---|

MATHS TEACHER HUB

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# Area and Perimeter

**(9 – 1) Topic booklet**

# Higher

**These questions have been collated from previous years GCSE Mathematics papers.**

| **You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. | Total Marks |
|---|---|

## Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1H** question you are not allowed to use a calculator.
- If the question is a **2H** or a **3H** question, you may use a calculator to help you answer.

### Information

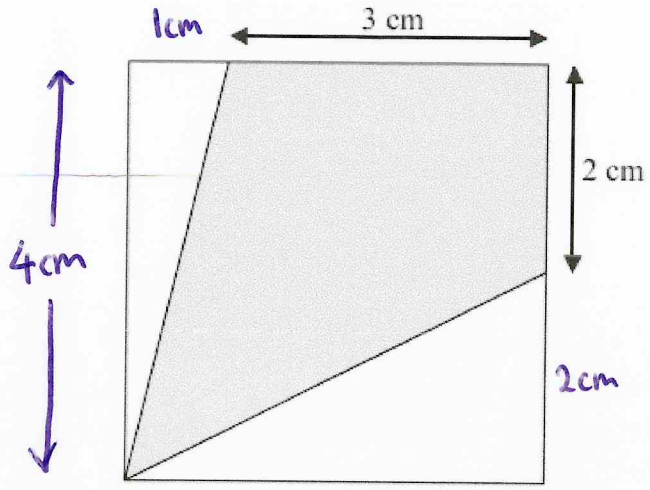
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**Answer ALL questions**
**Write your answers in the space provided.**
**You must write down all the stages in your working.**

2 The diagram shows a square with perimeter 16 cm.




Work out the proportion of the area inside the square that is shaded.

4 (square) 4 $= 4 \times 4 = 16\text{cm}^2$

Shaded region $= 10\text{cm}^2$

4 (triangle, 1) $= \frac{1 \times 4}{2} = 2\text{cm}^2$

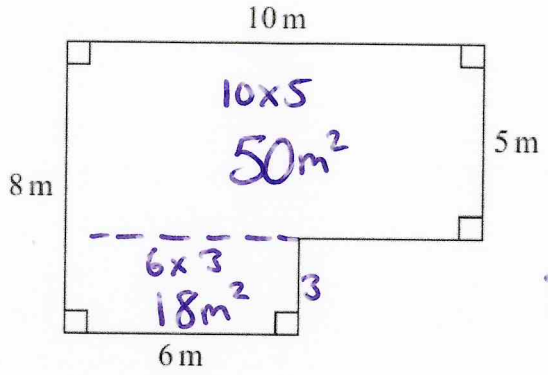
(triangle, 4, 2) $= \frac{2 \times 4}{2} = 4\text{cm}^2$

$\frac{10}{16} = \frac{5}{8}$



**(Total for Question 2 is 5 marks)**

3 The diagram shows a plan of a floor.




Total area
= 68m²

Petra is going to cover the floor with paint.

Petra has 3 tins of paint.
There are 2.5 litres of paint in each tin.

3 tins × 2.5 litres
= 7.5 litres

Petra thinks 1 litre of paint will cover 10 m² of floor.

(a) Assuming Petra is correct, does she have enough paint to cover the floor?
You must show all your working.

7.5 × 10 = 75m²

Yes there is enough to paint the floor.

(4)

Actually, 1 litre of paint will cover 11 m² of floor.

(b) Does this affect your answer to part (a)?
You must give a reason for your answer.

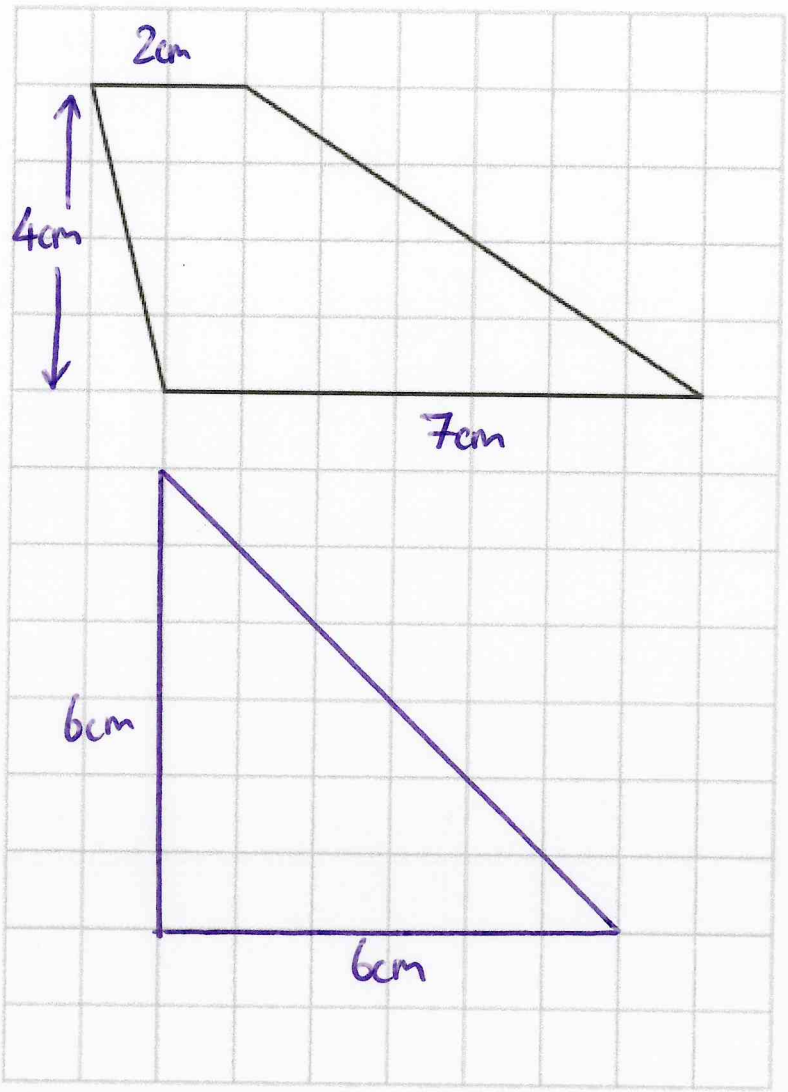
No there will still be more than enough, there will be even more paint

(1)



**(Total for Question 3 is 5 marks)**

3 Here is a trapezium drawn on a centimetre grid.




On the grid, draw a triangle equal in area to this trapezium.

Trapezium = $\frac{1}{2}(2+7) \times 4$

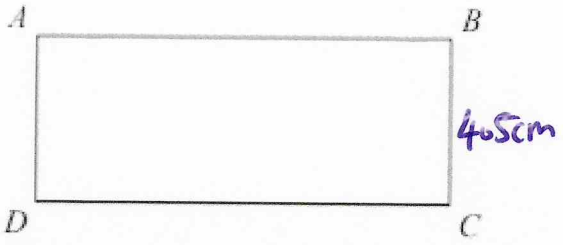
$= 18\text{cm}^2$

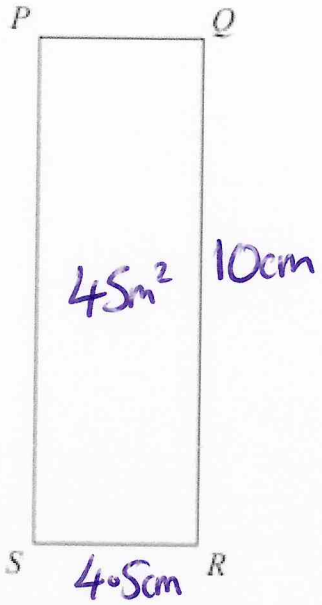
Triangle = $\frac{6 \times 6}{2} = 18\text{cm}^2$



**(Total for Question 3 is 2 marks)**

7 Here are two rectangles.



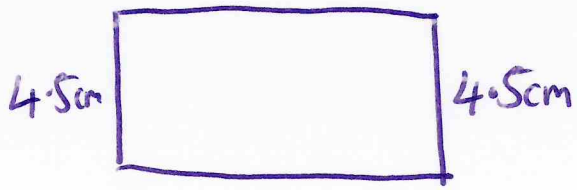




$QR = 10\,\text{cm}$
$BC = PQ$

The perimeter of $ABCD$ is 26 cm
The area of $PQRS$ is $45\,\text{cm}^2$

Find the length of $AB$.

$45\text{m}^2 \div 10\text{cm} = 4.5\text{cm}$




Perimeter = 26cm

26cm − 9cm = 17cm

17cm ÷ 2 = 8.5cm

8.5 cm

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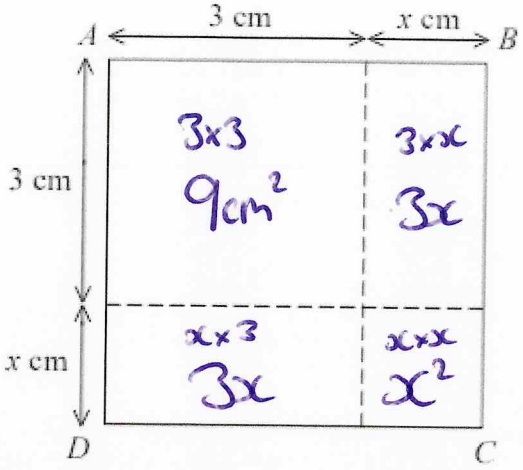
**(Total for Question 7 is 4 marks)**

4




The area of square $ABCD$ is 10 cm$^2$.

Show that $x^2 + 6x = 1$

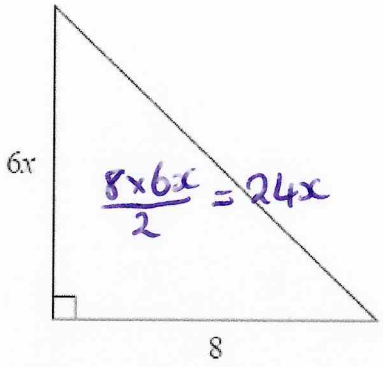
$x^2 + 3x + 3x + 9 = 10$

$x^2 + 6x = 1$



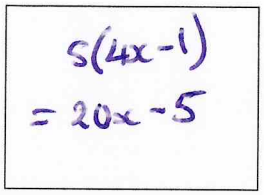
**(Total for Question 4 is 3 marks)**

**5** Here is a triangle and a rectangle.




$\frac{8 \times 6x}{2} = 24x$

$5(4x-1)$
$= 20x - 5$




All measurements are in centimetres.

The area of the triangle is $10\,cm^2$ greater than the area of the rectangle.

Work out the value of $x$.

$24x - 10 = 20x - 5$

$-20x$ $-20x$

$4x - 10 = -5$

$+10$ $+10$

$4x = 5$

$\div 4$ $\div 4$

$x = \frac{5}{4}$

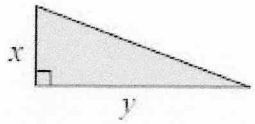
$x = 1.25$

$x =$ 1.25

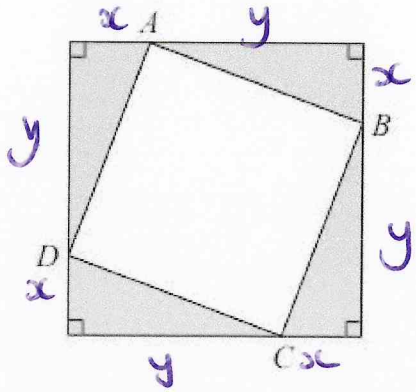


**(Total for Question 5 is 4 marks)**

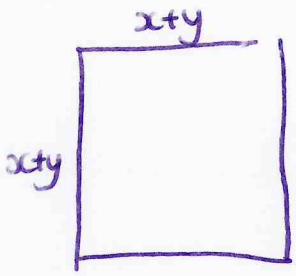
7 Here is a right-angled triangle.




Four of these triangles are joined to enclose the square $ABCD$ as shown below.




Show that the area of the square $ABCD$ is $x^2 + y^2$





$\frac{x \times y}{2} = \frac{1}{2}xy \longrightarrow$ ×4 as there are 4 triangles $= 2xy$

$(x+y)(x+y)$

$= x^2 + 2xy + y^2$

$x^2 + 2xy + y^2 - 2xy$

$= x^2 + y^2$



**(Total for Question 7 is 3 marks)**

**11** The floor plan of a house is drawn using a scale of 1 : 50
On the plan, a room in the house has a floor area of 48 $cm^2$

Work out the real area of the floor of this room.
Give your answer in $m^2$

linear 1 : 50

Area 1 : 2500

$48 \times 2500 = 120000 cm^2$

120cm | $=120000 cm^2$ | 1000cm → 1.2m | $10 \times 1.2 = 12 m^2$ | 10m

12 $m^2$



**(Total for Question 11 is 3 marks)**