

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE
B392/01**

**METHODS IN MATHEMATICS
Methods in Mathematics 2
(Foundation Tier)**

**THURSDAY 16 JUNE 2016: Afternoon
DURATION: 1 hour 30 minutes
plus your additional time allowance
MODIFIED ENLARGED 24pt**

Candidate forename						Candidate surname				
Centre number						Candidate number				

Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Scientific or graphical calculator

Geometrical instruments

Tracing paper (optional)

YOU ARE PERMITTED TO USE A CALCULATOR FOR THIS PAPER

READ INSTRUCTIONS OVERLEAF



INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.

Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

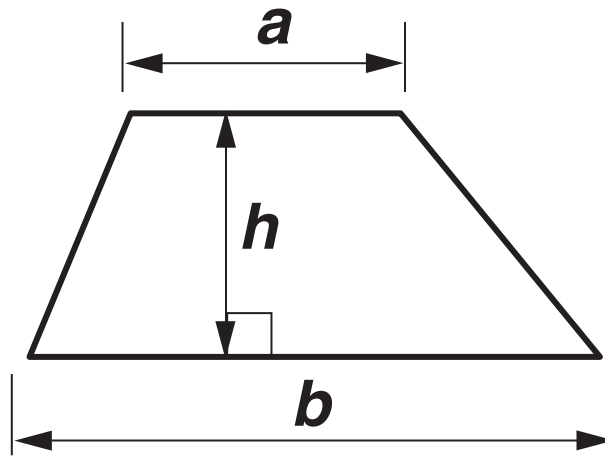
Quality of written communication will be assessed in questions marked with an asterisk (*).

The total number of marks for this paper is 90.

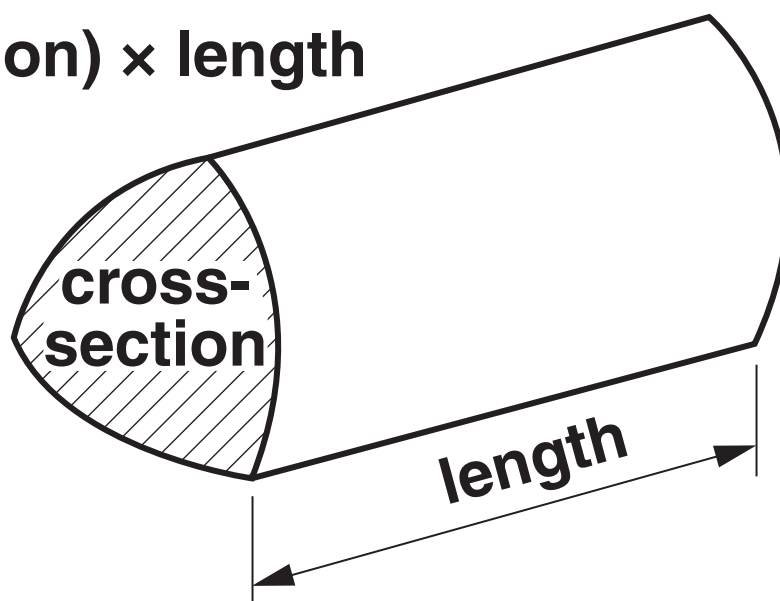
Any blank pages are indicated.

FORMULAE SHEET: FOUNDATION TIER

Area of trapezium
 $= \frac{1}{2}(a + b)h$

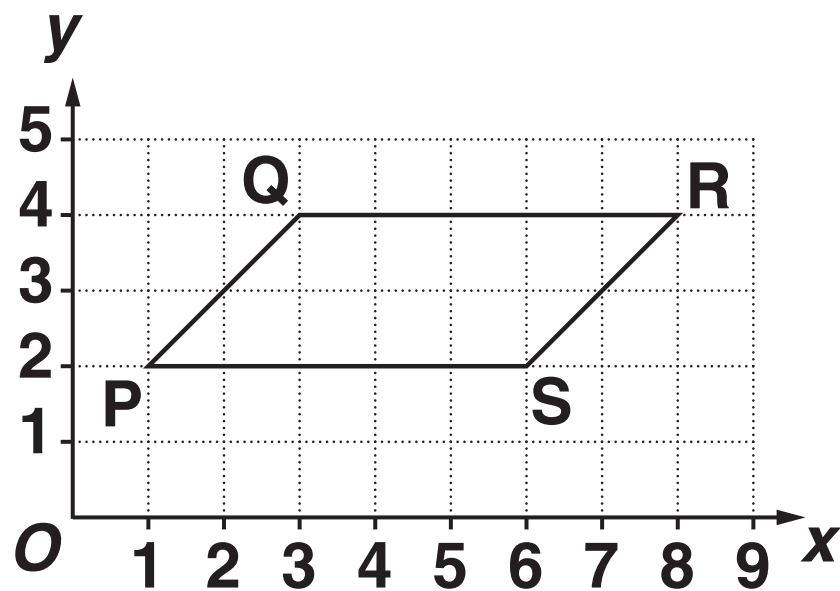


Volume of prism
 $= (\text{area of cross-section}) \times \text{length}$



Answer ALL the questions.

1 Quadrilateral PQRS is drawn on a one-centimetre grid.



(a) What is the mathematical name for quadrilateral PQRS?

(a) _____ [1]

(b) Work out the area of quadrilateral PQRS.

(b) _____ cm² [2]

(c) Write down the coordinates of points P and R.

(c) P (_____ , _____) [1]

R (_____ , _____) [1]

(d) Work out the coordinates of the midpoint of the diagonal PR.

(d) (_____ , _____) [2]

2 Solve.

(a) $x - 14 = 21$

(a) _____ [1]

(b) $x + 57 = 120$

(b) _____ [1]

(c) $5x = 80$

(c) _____ [1]

3 (a) Find the next three terms of each sequence.

(i) 26, 21, 16, 11, _____, _____, _____

[2]

(ii) 2, 6, 18, 54, _____, _____, _____

[2]

(b)* These are the first five terms of another sequence.

3 14 25 36 47

Lucy says, ‘The 6th term of the sequence is 58 and so I just have to double 58 to find the 12th term.’

Show that Lucy is NOT correct.

[2]

4 Work out.

(a) $\frac{2}{3}$ of £342

(a) £ _____ [2]

(b) 25% of £64

(b) £ _____ [2]

(c) 40% of £280

(c) £ _____ [2]

5 Work out the value of these expressions when $r = 3$, $s = 5$ and $t = -7$.

(a) $6r$

(a) _____ **[1]**

(b) $r - t$

(b) _____ **[1]**

(c) s^3

(c) _____ **[1]**

(d) $r(s + t)$

(d) _____ **[2]**

- 6 A supermarket sells chicken pieces in different pack sizes. Pack A has 3 pieces and pack B has 5 pieces.**

Rob and Sai are planning a party and they need exactly 28 pieces of chicken.

- (a) Rob suggests they buy one pack A and five pack Bs. Sai suggests a different way to buy exactly 28 pieces of chicken.**

Find the way Sai suggests.

(a) _____ pack A and _____ pack B [2]

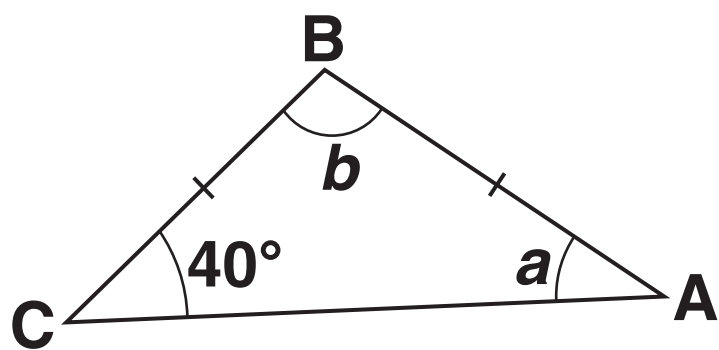
- (b) Pack A costs £1.45 and pack B costs £2.40.**

Work out whose suggestion is cheaper and by how much.

(b) _____ suggestion is cheaper by _____ [4]

- 7 (a) ABC is an isosceles triangle, with $BC = BA$.
Angle $BCA = 40^\circ$.

NOT TO SCALE



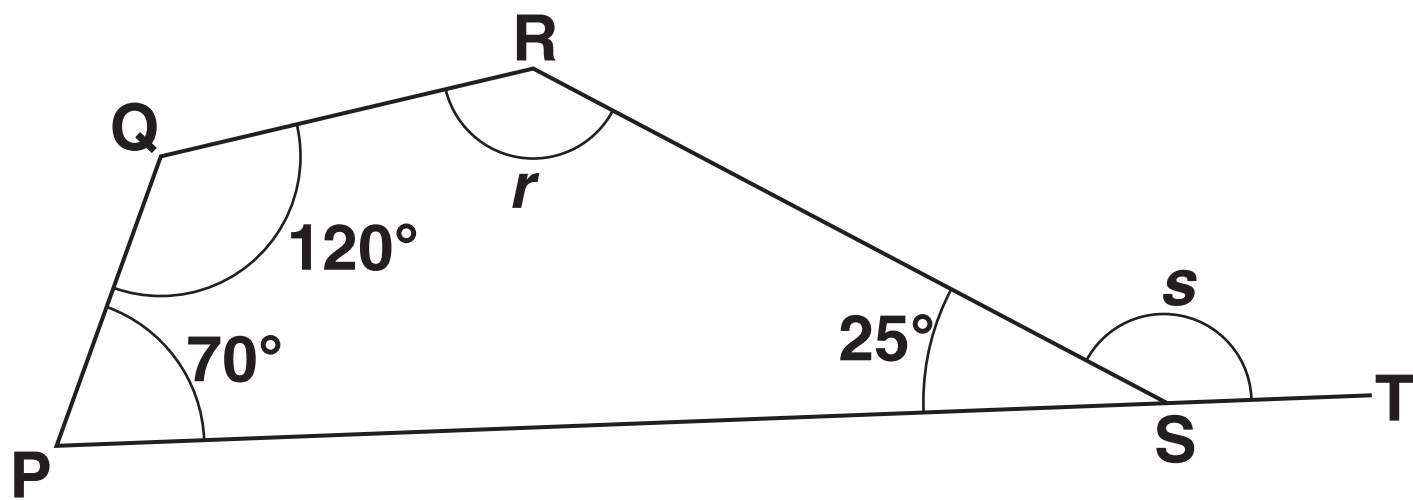
Work out angle a and angle b .

(a) $a =$ _____ $^\circ$ [1]

$b =$ _____ $^\circ$ [1]

- (b) PQRS is a quadrilateral. PST is a straight line. Angle QPS = 70° , angle PQR = 120° and angle RSP = 25° .

NOT TO SCALE



Work out angle r and angle s .

(b) $r =$ _____ $^\circ$ [2]

$s =$ _____ $^\circ$ [2]

8 Barry thinks that these two calculations give the same answer.

$$578^2 - 312^2 \quad \text{and} \quad (578 - 312)(578 + 312)$$

Rebecca thinks that these two calculations give the same answer.

$$8.6^2 - 3.4^2 \quad \text{and} \quad (8.6 - 3.4)(8.6 + 3.4)$$

Complete these calculations and decide who is correct.

$$578^2 - 312^2 = \underline{\hspace{2cm}}$$

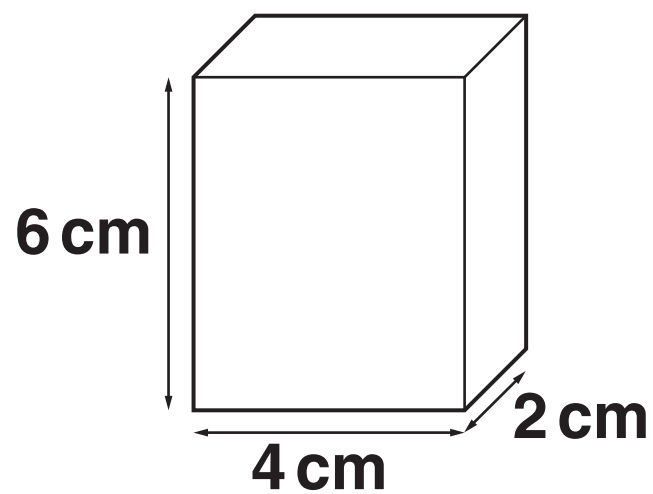
$$(578 - 312)(578 - 312) = \underline{\hspace{2cm}}$$

$$8.6^2 - 3.4^2 = \underline{\hspace{2cm}}$$

$$(8.6 - 3.4)(8.6 + 3.4) = \underline{\hspace{2cm}}$$

_____ is correct [4]

- 9 Helen has some small cubes.
Each cube is 1 cm by 1 cm by 1 cm.
Helen uses all of these small cubes to make this cuboid.



The dimensions of Helen's cuboid are 6 cm by 4 cm by 2 cm.

Helen then uses all these small cubes to make a cuboid with a SQUARE BASE.

Find the dimensions of two different cuboids with a square base that Helen could make.

_____ cm by _____ cm by _____ cm
_____ cm by _____ cm by _____ cm [3]

10 (a) Complete the table for $y = 5x - 3$.

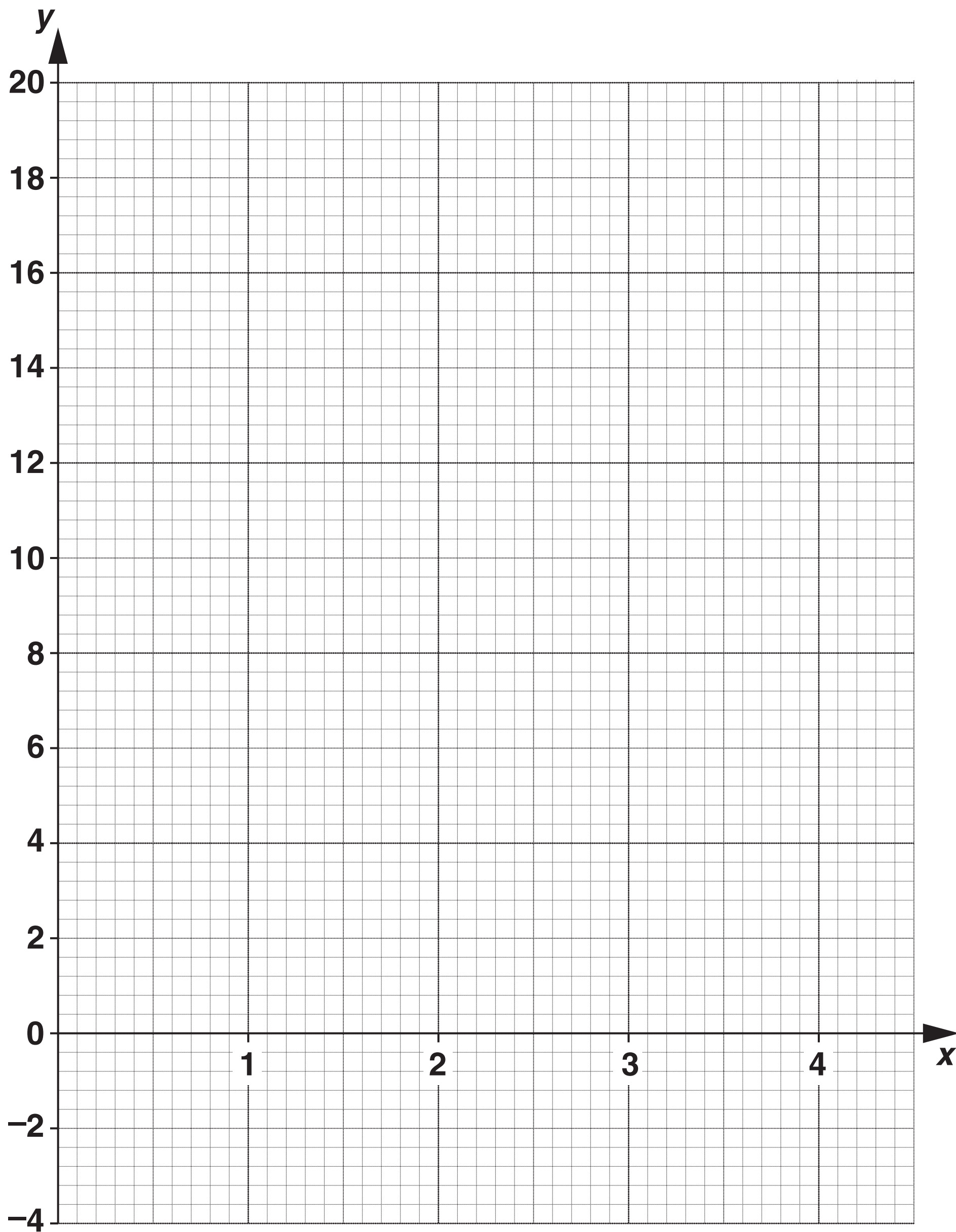
x	0	1	2	3	4
y					

[2]

(b) Draw the graph of $y = 5x - 3$ for values of x from 0 to 4 on the grid opposite.

(c) Solve $5x - 3 = 9$.

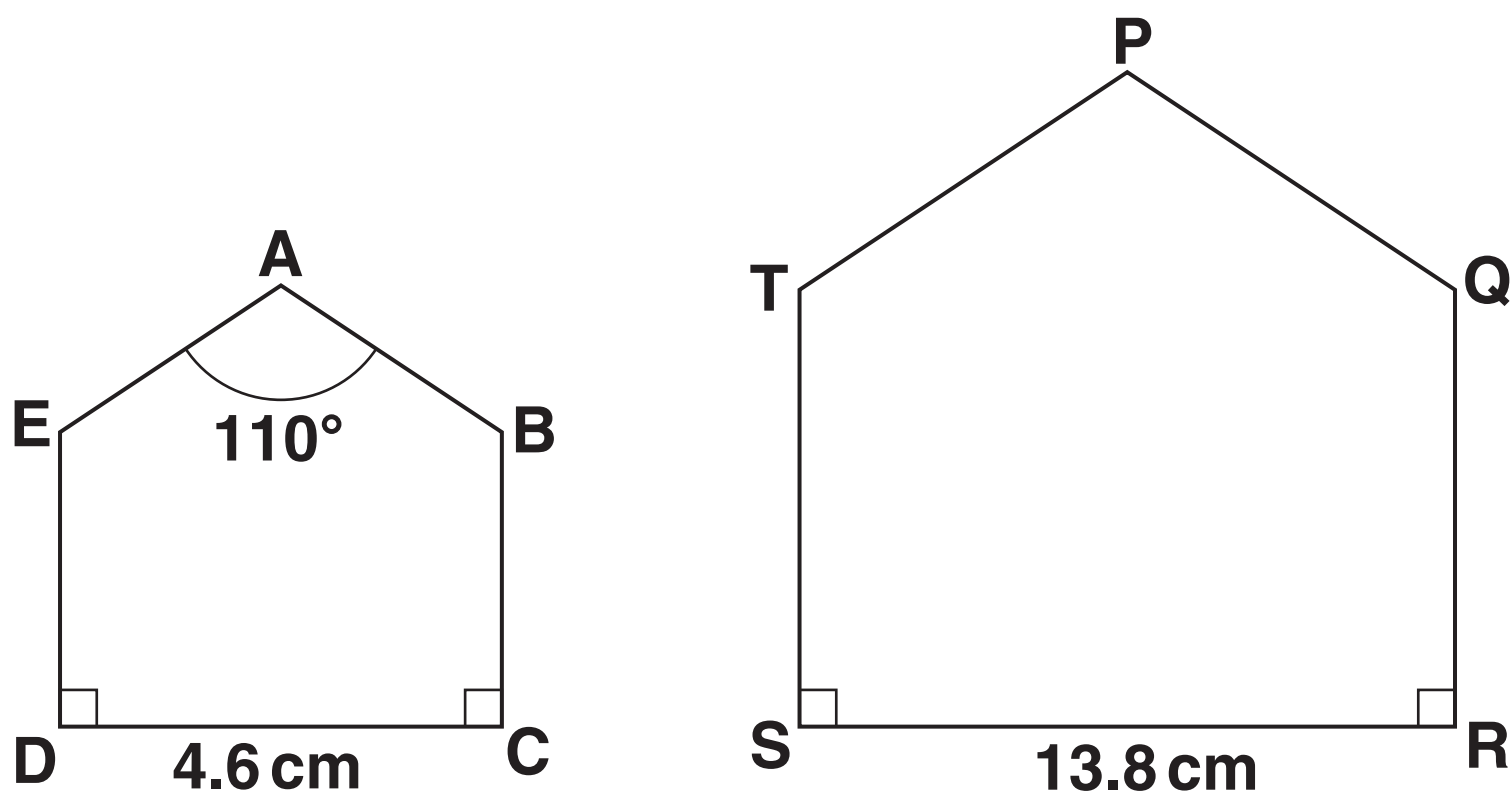
(c) _____ [2]



[2]

- 11 The pentagons ABCDE and PQRST are mathematically similar.

NOT TO SCALE



$DC = 4.6 \text{ cm}$ and $SR = 13.8 \text{ cm}$. Angle $EAB = 110^\circ$.

The perimeter of ABCDE is 18.2 cm .

(a) Find the size of angle TPQ.

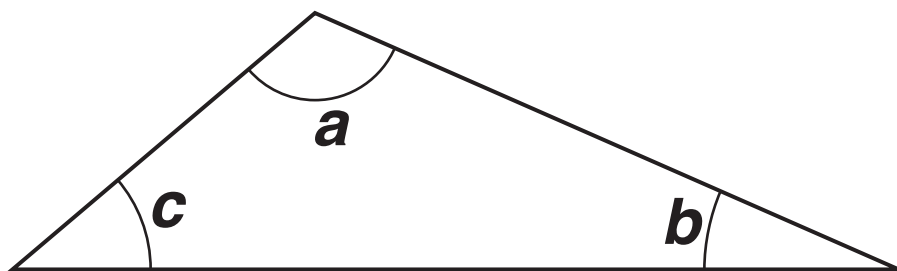
(a) _____ $^\circ$ [1]

(b) Find the perimeter of PQRST.

(b) _____ cm [2]

- 12 (a) The angles of this triangle, a , b and c , are measured in degrees.
Angle a is an obtuse angle.

NOT TO SCALE



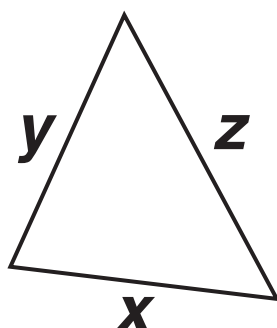
Draw a ring around the inequality that is true for these angles.

$a > b + c$ $a < b + c$ $a + b < c$ $a \leq b + c$

[1]

- (b) This is a different triangle.

NOT TO SCALE



The lengths of the sides, x , y and z , are measured in centimetres.

Draw a ring around the inequality that is true for these lengths.

$x > y + z$ $x < y + z$ $x \geq y + z$ $y > x + z$

[1]

13 Draw a line to match each statement on the left with the way of working it out on the right.

An example has been done for you.

Some of the boxes on the right will not be used.

	<div>0.28 × 875</div>
<div>Find 30% of 875</div>	<div>0.34 × 875</div>
<div>Increase 875 by 34%</div>	<div>0.3 × 875</div>
	<div>0.72 × 875</div>
<div>Increase 875 by 6%</div>	<div>1.34 × 875</div>
<div>Decrease 875 by 28%</div>	<div>1.6 × 875</div>
	<div>1.06 × 875</div>

[3]

14 (a) Fill in the missing fractions, decimals and percentages in the table below.
 Give answers in their simplest forms.
 The top row has been done for you.

FRACTION	DECIMAL	PERCENTAGE
$\frac{1}{4}$	0.25	25%
		30%
$\frac{7}{20}$		
	0.64	

[4]

(b) Find the missing number.

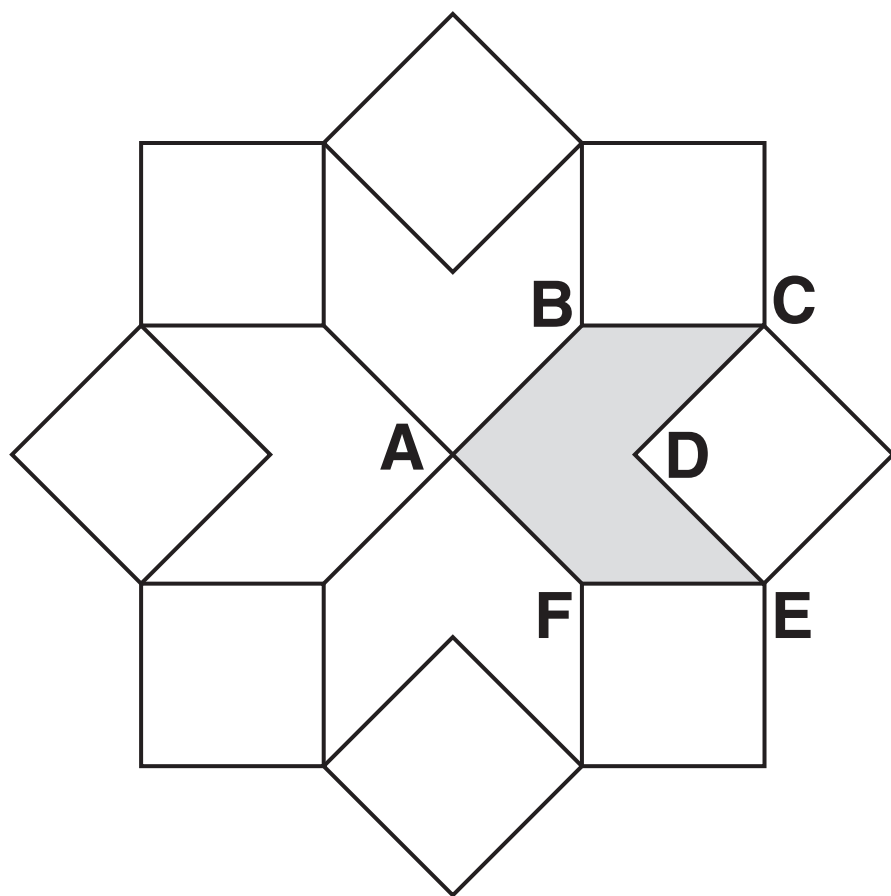
14 ×
= 1

[1]

(c) Find a number that is bigger than $\frac{1}{3}$ but smaller than $\frac{1}{2}$.

(c) _____ [2]

15* The tiling pattern below is made from eight congruent squares and four congruent hexagons. Each hexagon has one line of symmetry.



CALCULATE all six angles of hexagon ABCDEF. Give a geometrical reason for each step in your working.

[5]

16 (a) Share £60 in the ratio 8 : 7.

(a) £ _____ , £ _____ [2]

**(b) The ratio of red sweets to black sweets in a bag is 3 : 2.
There are only red sweets and black sweets in the bag.**

(i) What fraction of the sweets in the bag are red?

(b)(i) _____ [1]

**(ii) Kirsty opens the bag of sweets and eats 5 black sweets.
This leaves only one black sweet in the bag.**

What is the ratio of red sweets to black sweets now?

(ii) _____ : _____ [3]

17 (a) Solve.

$$7(x + 2) = 9x - 1$$

(a) _____ **[3]**

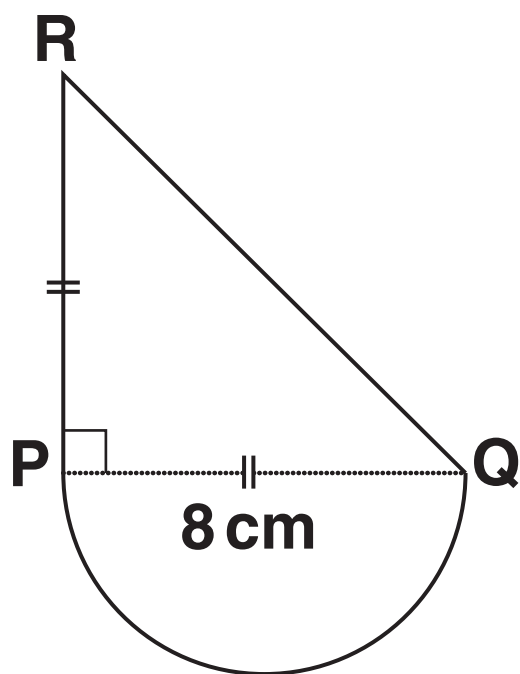
(b) Make t the subject of the following formula.

$$v = u + at$$

(b) _____ **[2]**

- 18 (a) The shape below is made from a semicircle and a triangle PQR.
The triangle is isosceles and right-angled.
PQ is the diameter of the semicircle.
PQ = 8 cm.

NOT TO SCALE



Calculate the area of the shape.

(a) _____ cm^2 [5]

**(b) The cross-section of a prism has area 81 cm^2 .
The volume of the prism is 350 cm^3 .**

Calculate the length of the prism.

(b) _____ cm [2]

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

[illegible]

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