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Oxford Cambridge and RSA

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Thursday 16 June 2016 – Afternoon

GCSE METHODS IN MATHEMATICS

**B392/01** Methods in Mathematics 2 (Foundation Tier)

Duration: 1 hour 30 minutes

B39201

Candidate forename		Candidate surname	

Centre number					Candidate number				

INSTRUCTIONS TO CANDIDATES

* Write your name, centre number and candidate number in the boxes above. 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.
* Do **not** write in the bar codes.

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**.
* This document consists of **20** pages. Any blank pages are indicated.

> You are permitted to use a calculator for this paper

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Turn over
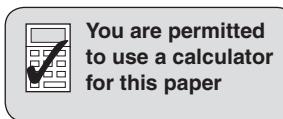
Formulae Sheet: Foundation Tier

Area of trapezium $= \frac{1}{2}(a + b)h$
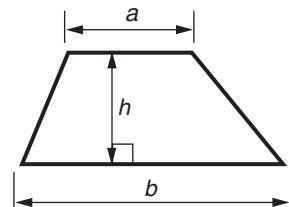
Volume of prism $=$ (area of cross-section) $\times$ length
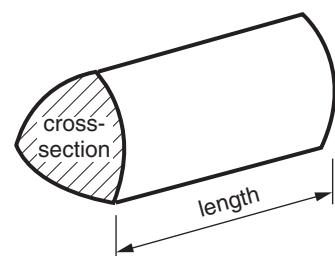
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3

Answer **all** the questions.

1 Quadrilateral PQRS is drawn on a one-centimetre grid.
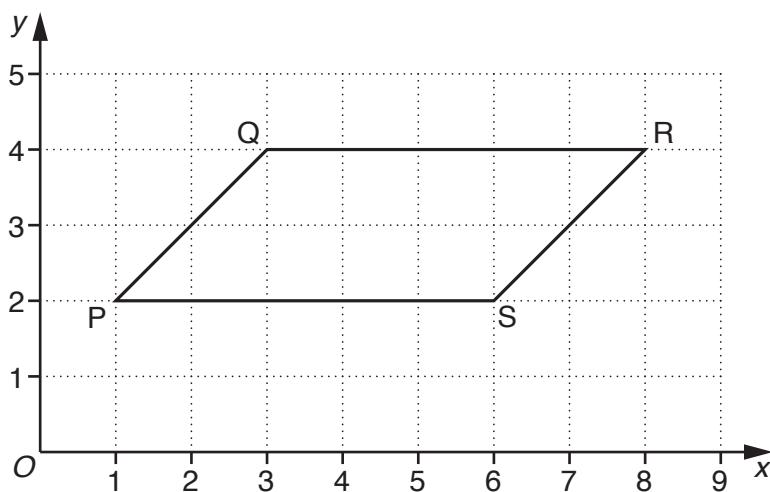
(a) What is the mathematical name for quadrilateral PQRS?

(a) .... **[1]**

(b) Work out the area of quadrilateral PQRS.

(b) .... cm^2 **[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]**

Turn over

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) $\dfrac{2}{3}$ 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

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°.

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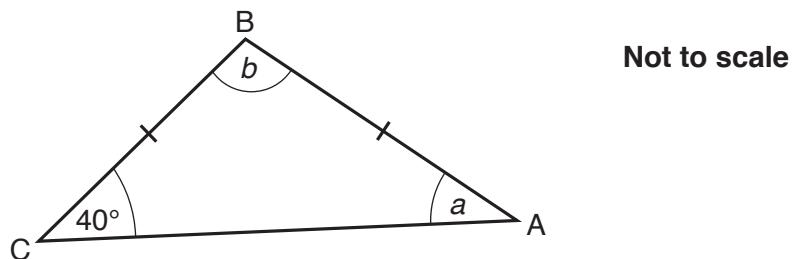
Work out angle *a* and angle *b*.

(a) *a* = ...° **[1]**

b = ...° **[1]**

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

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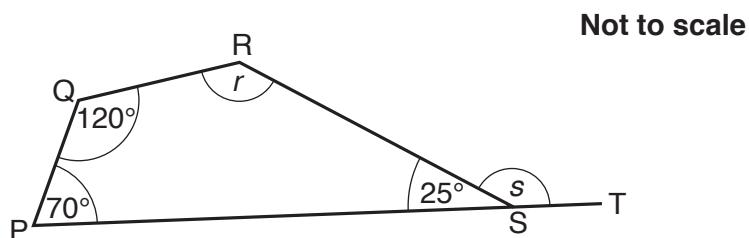
Work out angle *r* and angle *s*.

(b) *r* = ...° **[2]**

s = ...° **[2]**

Turn over

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

$578^2 - 312^2$ and $(578 - 312)(578 - 312)$

Rebecca thinks that these two calculations give the same answer.

$8.6^2 - 3.4^2$ and $(8.6 - 3.4)(8.6 + 3.4)$

Complete these calculations and decide who is correct.

$578^2 - 312^2$ = ...

$(578 - 312)(578 - 312)$ = ...

$8.6^2 - 3.4^2$ = ...

$(8.6 - 3.4)(8.6 + 3.4)$ = ...

.... 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.

6 cm

2 cm

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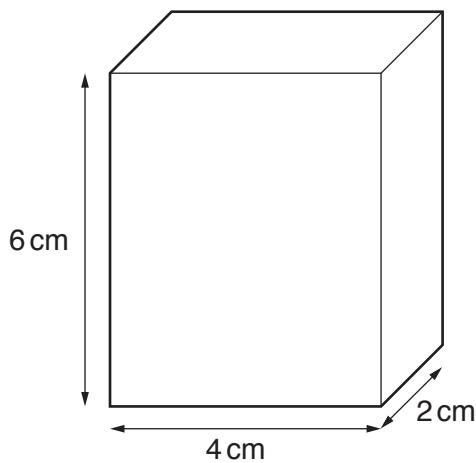
The dimensions of Helen's cuboid are 6 cm by 4 cm by 2 cm.

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]**

Turn over

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.
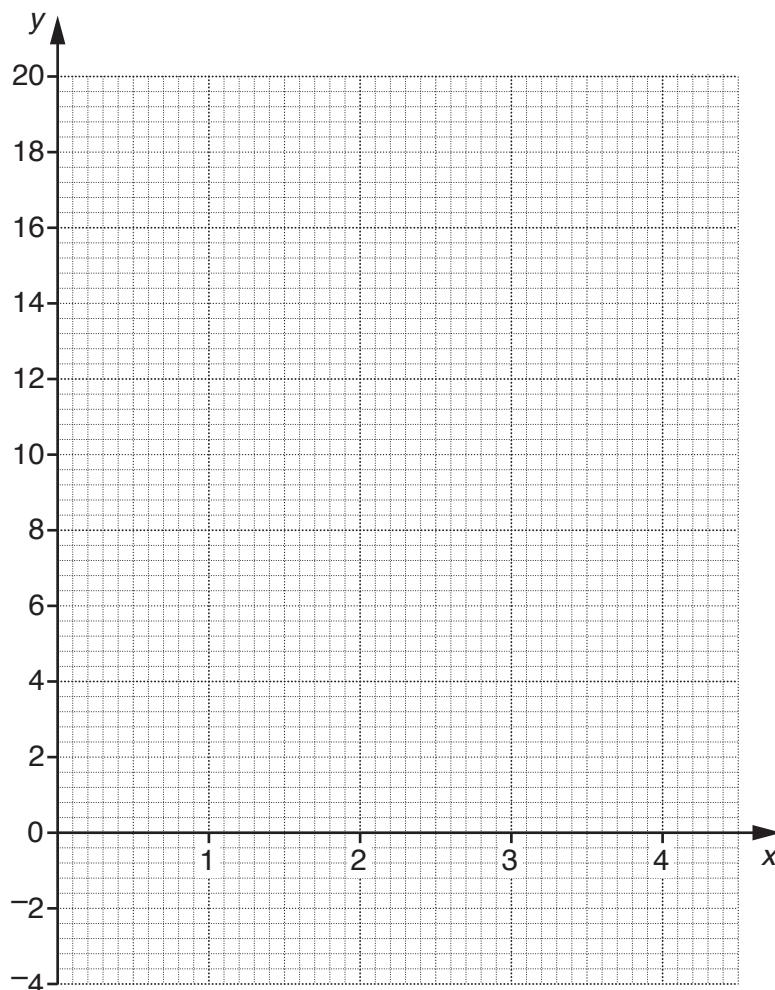
[2]

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

(c) .... [2]

11 The pentagons ABCDE and PQRST are mathematically similar.

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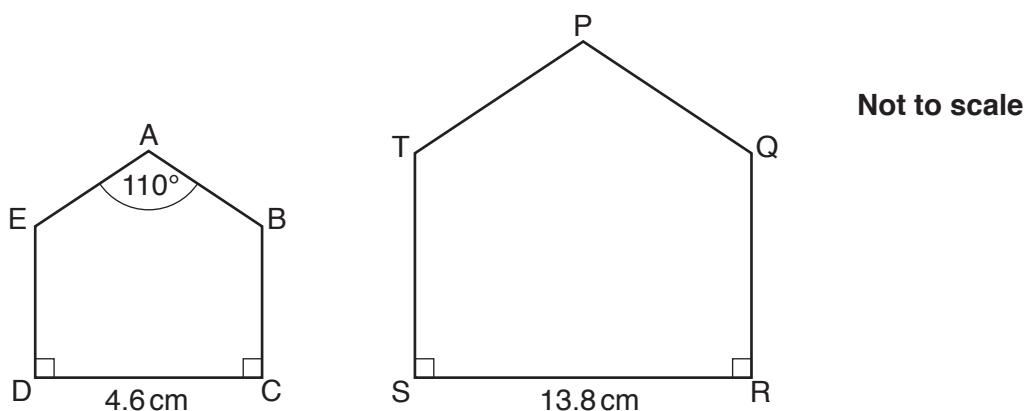
DC = 4.6 cm and SR = 13.8 cm. Angle EAB = 110°.

The perimeter of ABCDE is 18.2 cm.

(a) Find the size of angle TPQ.

(a) ....° **[1]**

(b) Find the perimeter of PQRST.

(b) .... cm **[2]**

Turn over

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

Not to scale
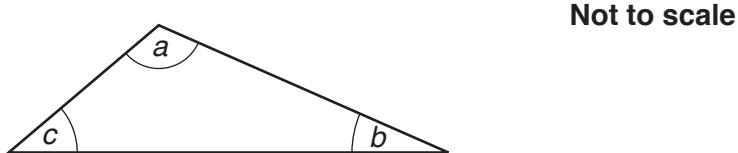
Draw a ring around the inequality that is true for these angles.

$$a > b + c \qquad a < b + c \qquad a + b < c \qquad a \leqslant b + c$$

[1]

(b) This is a different triangle.

Not to scale
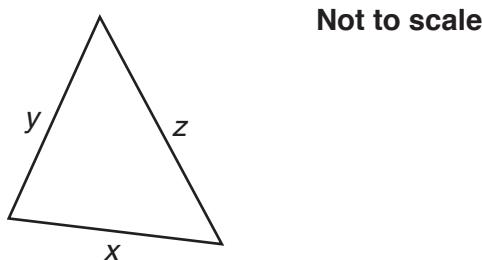
The lengths of the sides, *x*, *y* and *z*, are measured in centimetres.
Draw a ring around the inequality that is true for these lengths.

$$x > y + z \qquad x < y + z \qquad x \geqslant y + z \qquad y > x + z$$

[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.

	0.28×875

Find 30% of 875	0.34×875

0.3×875

Increase 875 by 34%

0.72×875

Increase 875 by 6%

1.34×875

Decrease 875 by 28%

1.6×875

1.06×875

[3]

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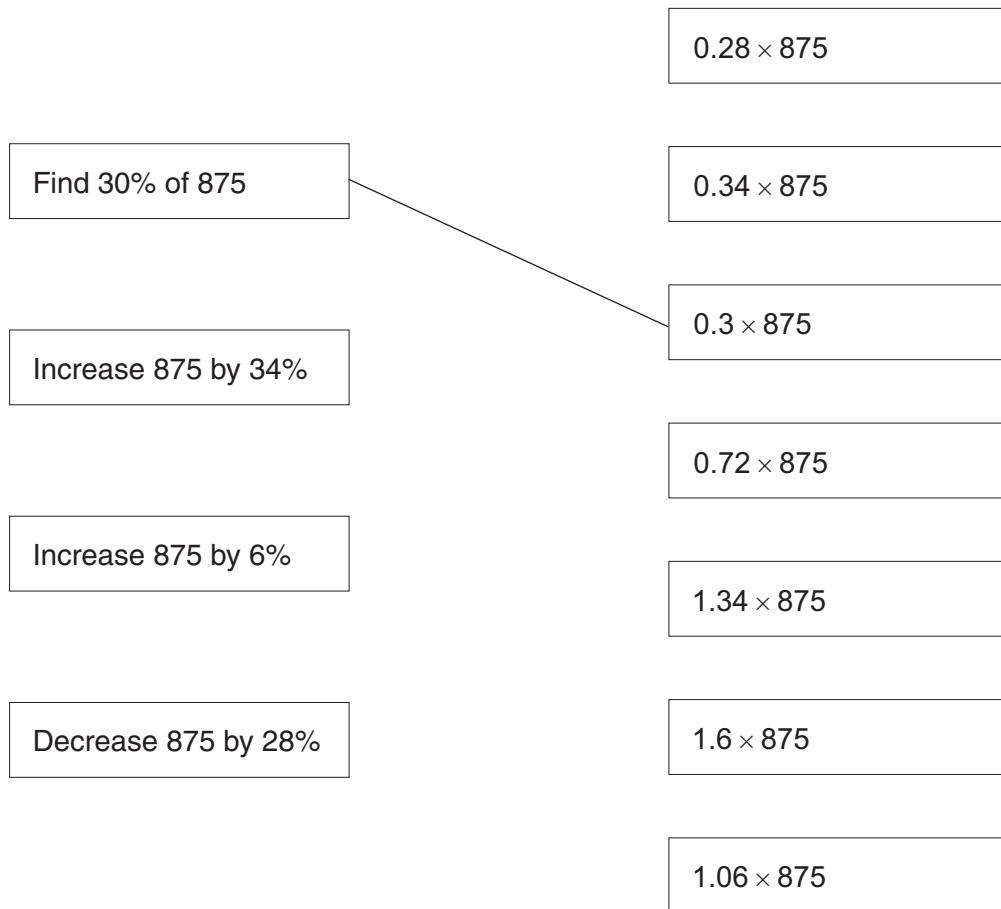
14 **(a)** Fill in the missing fractions, decimals and percentages in the table below.
Give answers in their simplest forms.
The top row has been done for you.

Fraction	Decimal	Percentage
$\dfrac{1}{4}$	0.25	25%
		30%
$\dfrac{7}{20}$		
	0.64	

[4]

(b) Find the missing number.

$$14 \times \boxed{} = 1$$

[1]

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

(c) .... [2]

15* The tiling pattern below is made from eight congruent squares and four congruent hexagons. Each hexagon has one line of symmetry.
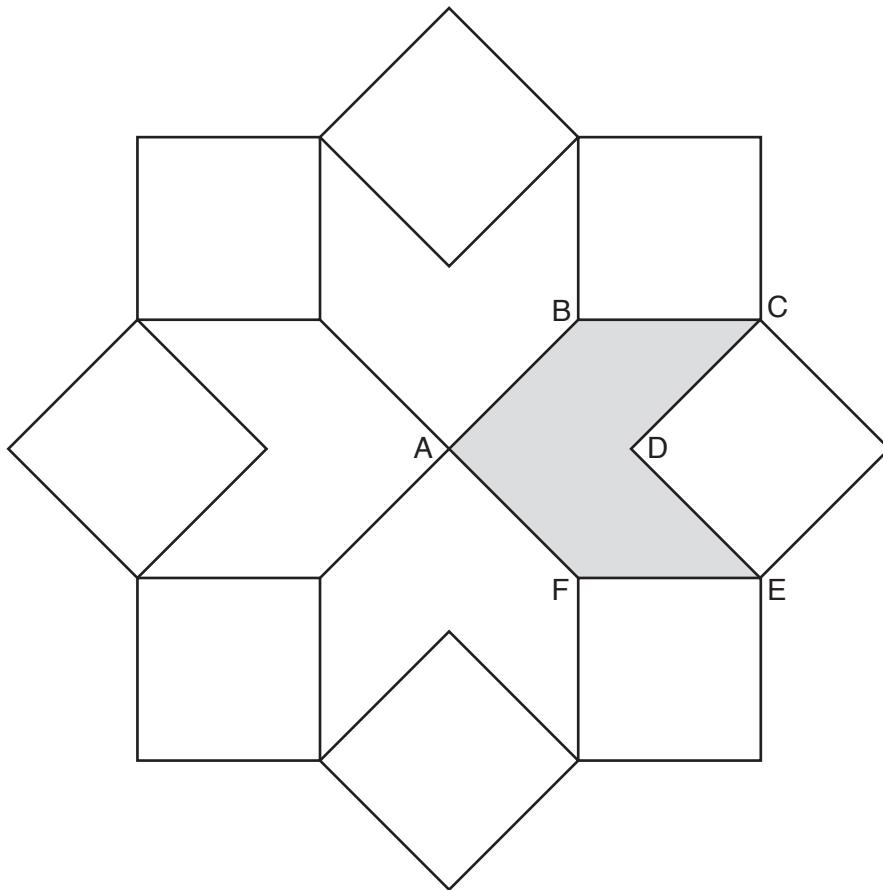
Calculate all six angles of hexagon ABCDEF. Give a geometrical reason for each step in your working.

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.... **[5]**

Turn over

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]**

Turn over

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
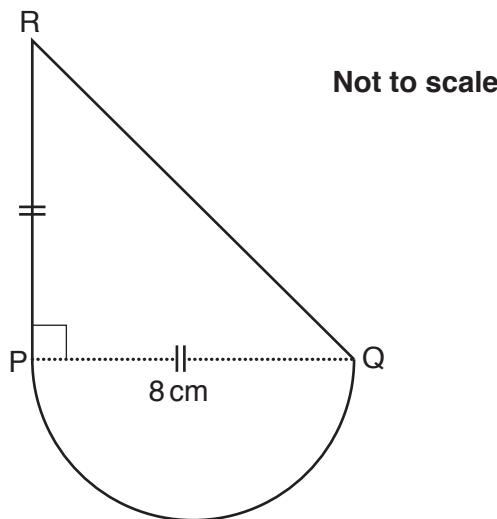
Calculate the area of the shape.

(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

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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).

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