Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 2017**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Tracing paper (optional)
Geometrical instruments

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 104.

This document consists of **16** printed pages.

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1 **(a)** Martha makes hats.
Each week she makes 160 hats.

(i) Work out how many hats she makes in 5 weeks.

..... [1]

(ii) The hats are made in the ratio

small : medium : large = 2 : 5 : 3.

Work out how many of the 160 hats are large.

..... [2]

(iii) She sells $\frac{3}{8}$ of the 160 hats.

Work out how many hats she sells.

..... [1]

(b) Nina sells T-shirts.
The prices are shown in the table.

Type	Plain	Striped	Logo
Price	$7.50	$9.50	$10.50

(i) Sam buys 3 plain T-shirts and 2 logo T-shirts.

Work out how much she pays altogether.

$ ..... [2]

(ii) One day, Nina reduces all prices by 20%.

Work out the new price of a striped T-shirt.

$ ..... [2]

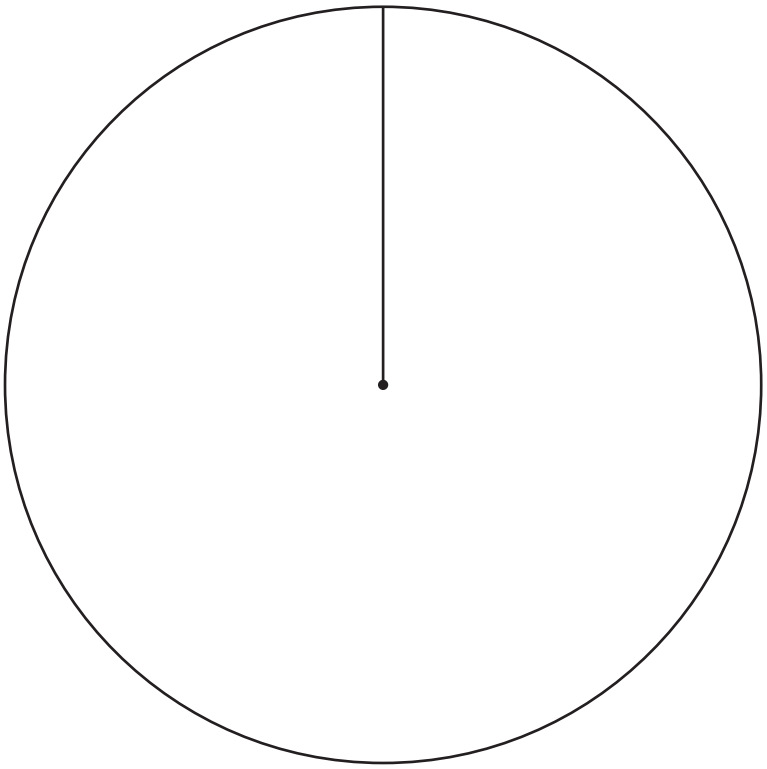
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(c) Nina sold 300 T-shirts in September.
She wants to show how many of each type she sold using a pie chart.

Type	Number sold	Pie chart sector angle
Plain	100	120°
Striped	85	
Logo	115	

(i) Complete the table. [2]

(ii) Complete the pie chart.



[2]

(d) Nina paid $22.50 for a dress.
She sold the dress for $31.50.

Work out her percentage profit.

.....% [3]

2 **(a)** Fill in the missing number in each calculation.

(i) $6 + 2 \times \ldots\ldots\ldots = 24$ [1]

(ii) $(10 - \ldots\ldots\ldots) \div 3 = 2$ [1]

(b) Find the value of

(i) $\sqrt{1.96}$,

..... [1]

(ii) 16^3.

..... [1]

(c) Work out $\dfrac{7.82 - 4.15}{5.25 \times 16.4}$.

Give your answer correct to 2 significant figures.

..... [2]

(d) $V = \frac{1}{3}a^2h$

Calculate V when $a = 4.5$ and $h = 9.6$.

$V =$ ..... [2]

(e) Put a ring around the irrational number in the list below.

$\frac{2}{3}$ $\sqrt{5}$ $-\frac{5}{7}$ $\sqrt{36}$ $1\frac{4}{5}$ [1]

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(f) Written as a product of its prime factors, $T = 2^2 \times 3 \times 5^2$.

(i) Work out the value of T.

$T =$ ..... [1]

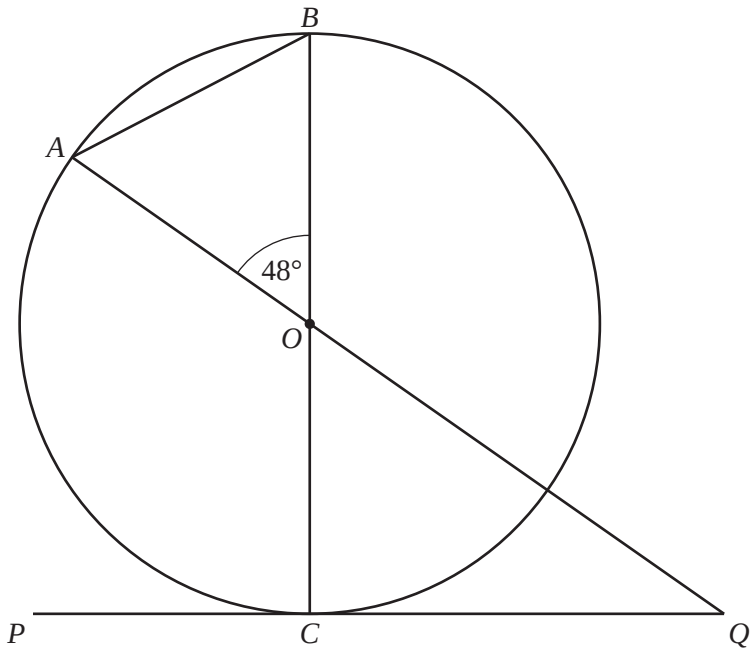
(ii) Write 80 as a product of its prime factors.

..... [2]

(iii) Find the highest common factor (HCF) of T and 80.

..... [2]

3



NOT TO SCALE

A, *B* and *C* are points on the circumference of the circle, centre *O*.
BC is a diameter of the circle.
PQ touches the circle at *C* and *AOQ* is a straight line.

(a) Write down the mathematical name for

(i) line *AB*,

..... [1]

(ii) *PQ*.

.....[1]

(b) Find the size of

(i) angle *COQ*,

Angle *COQ* = ... [1]

(ii) angle *ABO*,

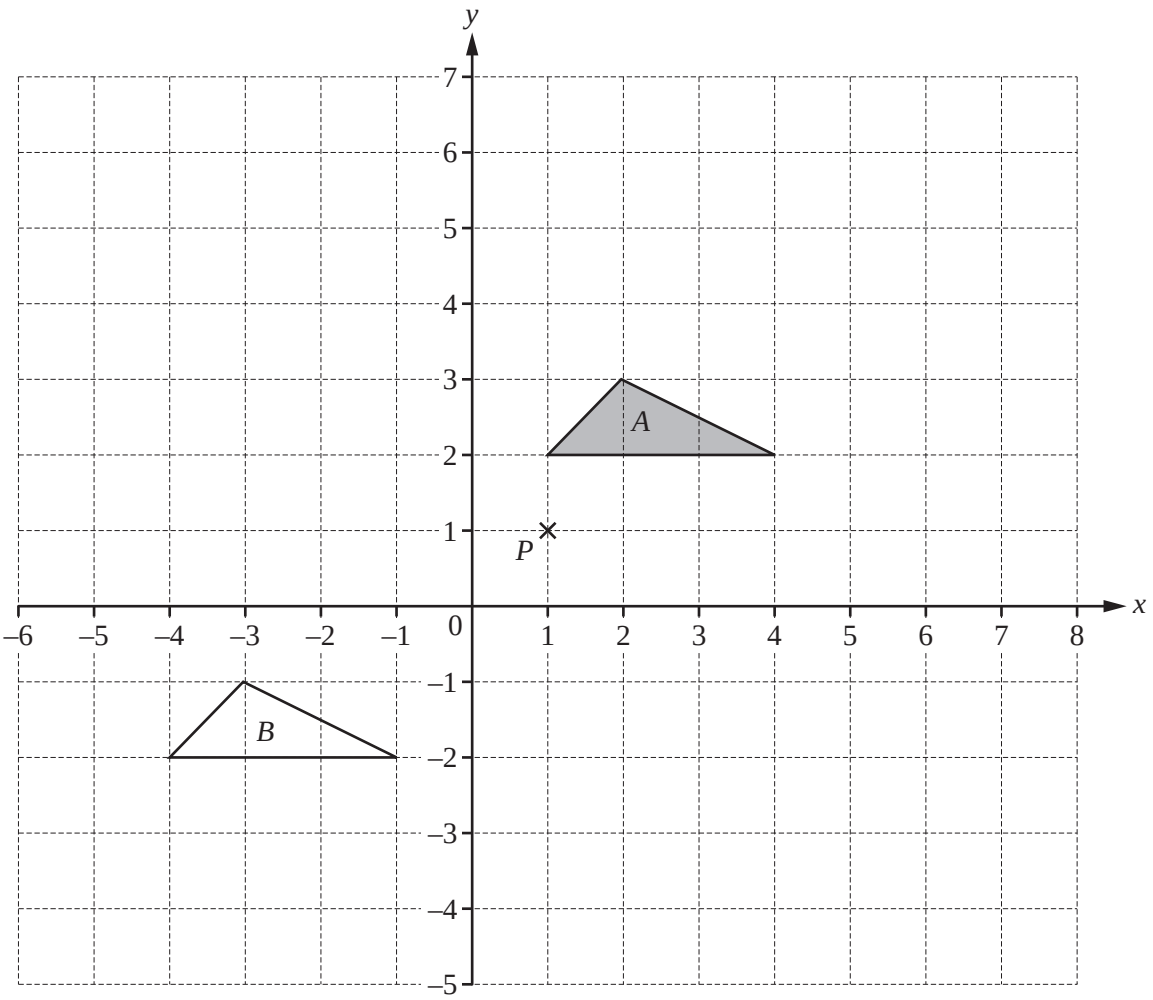
Angle *ABO* = ... [2]

(iii) angle *OQC*.

Angle *OQC* = ... [2]

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4 The diagram shows two triangles *A* and *B* and point *P* on a 1 cm^2 grid.



(a) Write down the mathematical name for triangle *A*.

..... [1]

(b) Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

.....

..... [2]

(c) Rotate triangle *A* by 90° clockwise about (0, 0). [2]

(d) **(i)** Work out the area of triangle *A*.

.....cm^2 [1]

(ii) Enlarge triangle *A* with scale factor 2 and centre *P*. [2]

(iii) Complete the statement.

The area of the enlarged triangle is ..... times the area of triangle *A*. [2]

5 **(a)** A small box contains n biscuits.

(i) A medium box contains 10 more biscuits than the small box.

Write an expression, in terms of n, for the number of biscuits in the medium box.

..... [1]

(ii) A large box contains twice as many biscuits as the **medium** box.

Write an expression, in terms of n, for the number of biscuits in the large box.

..... [1]

(iii) There are 52 biscuits in the large box.

Write down an equation, in terms of n, and solve it.

$n =$ ..... [3]

(iv) Olga buys a small box and a medium box of biscuits.

How many biscuits does she have altogether?

..... [1]

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(b) In the large box, 13 of the 52 biscuits are chocolate.
Leo takes a biscuit from the box at random.

(i) Find the probability that Leo's biscuit is chocolate.
Give your answer as a fraction in its lowest terms.

..... [2]

(ii) On the probability scale, draw an arrow to show the probability that Leo's biscuit is **not** chocolate.



[1]

(c) The mass of the large box of biscuits is 450 g.

Work out the total mass of 6 large boxes of biscuits.
Give your answer in kilograms.

..... kg [2]

(d) The mass, m grams, of the small box of biscuits is 120 g, correct to the nearest 10 g.

Complete the statement about the value of m.

..... $\leqslant m <$ .....[2]

6 **(a)** Luca records the total distance, in kilometres, he walks each day for 10 days.
Here are his results.

4.7 2.4 10.3 3.6 2.3 4.3 5.1 2.6 6.9 9.6

(i) Find the median.

..... km [2]

(ii) Find the range.

..... km [1]

(iii) Calculate the mean.

..... km [2]

(b) **(i)** On another day, Luca walks 9 km.
He starts walking at 14 20 and he walks at an average speed of 6 km/h.

Work out the time he finishes.

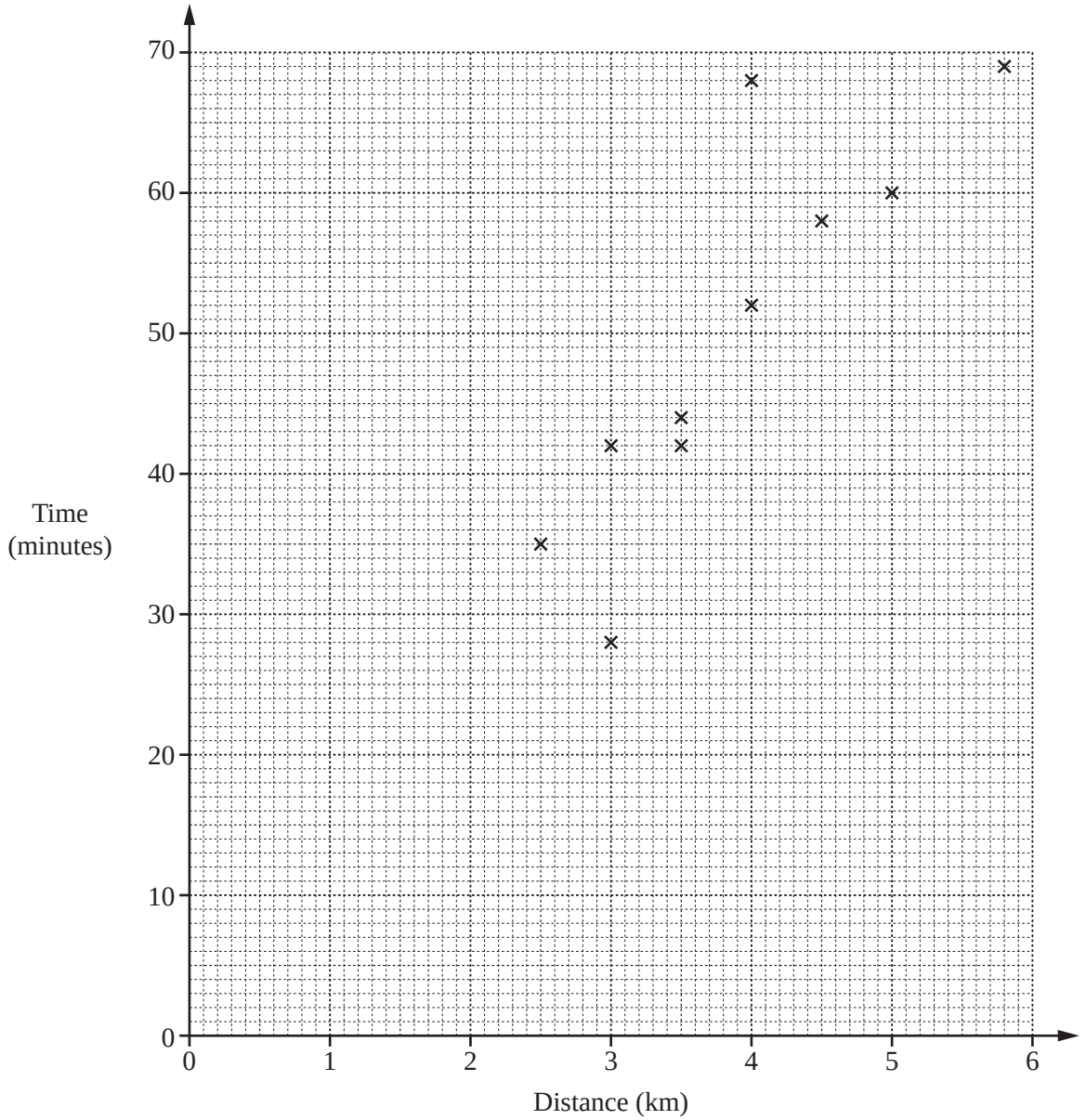
..... [2]

(ii) Convert 6 km/h to metres per minute.

..... m/min [2]

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(c) For another 10 days, Luca records the distance he walks each day and the time it takes. The scatter diagram shows this information.



(i) What type of correlation is shown on the scatter diagram?

..... [1]

(ii) On one of these days, Luca's average speed was much slower than on all of the other days.

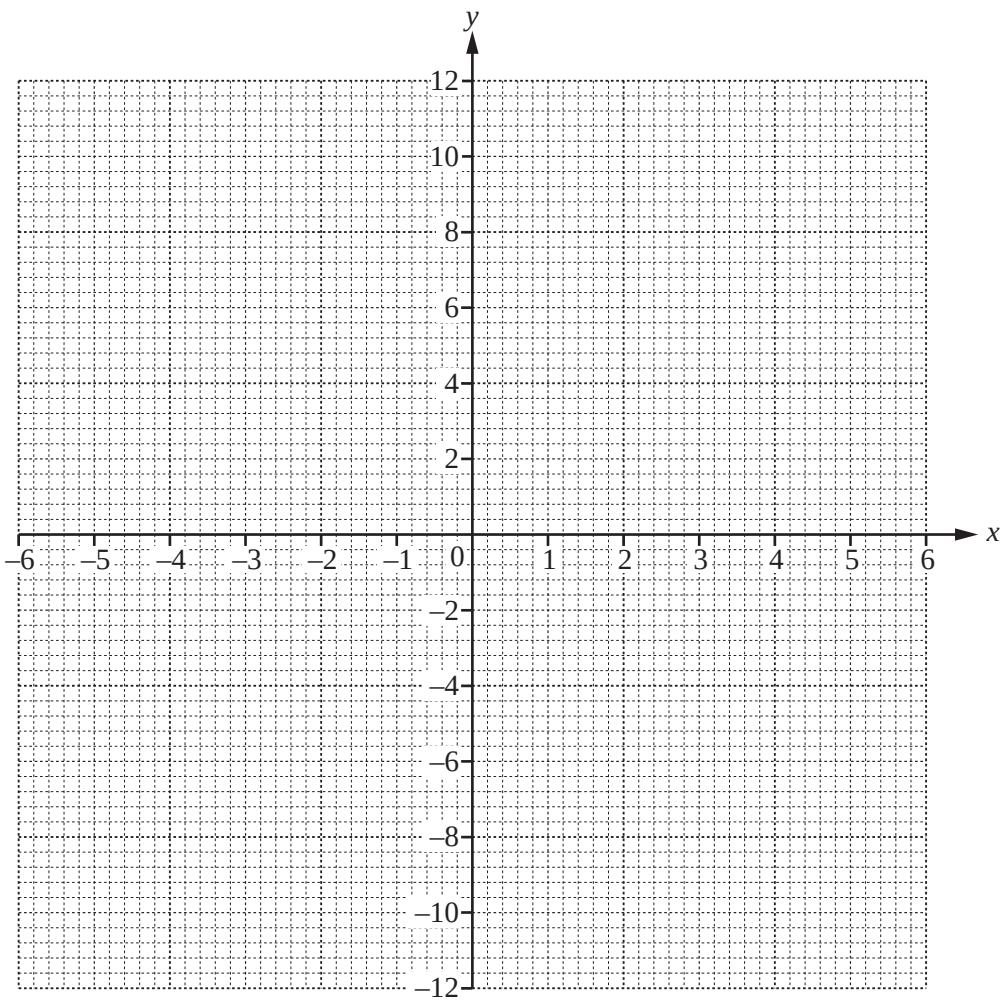
Draw a ring around this point on the scatter diagram. [1]

7 **(a)** **(i)** Complete the table of values for $y = \frac{12}{x}$.

x	–6	–4	–2	–1		1	2	4	6
y	–2			–12		12			2

[2]

(ii) On the grid, draw the graph of $y = \frac{12}{x}$ for $-6 \leqslant x \leqslant -1$ and $1 \leqslant x \leqslant 6$.



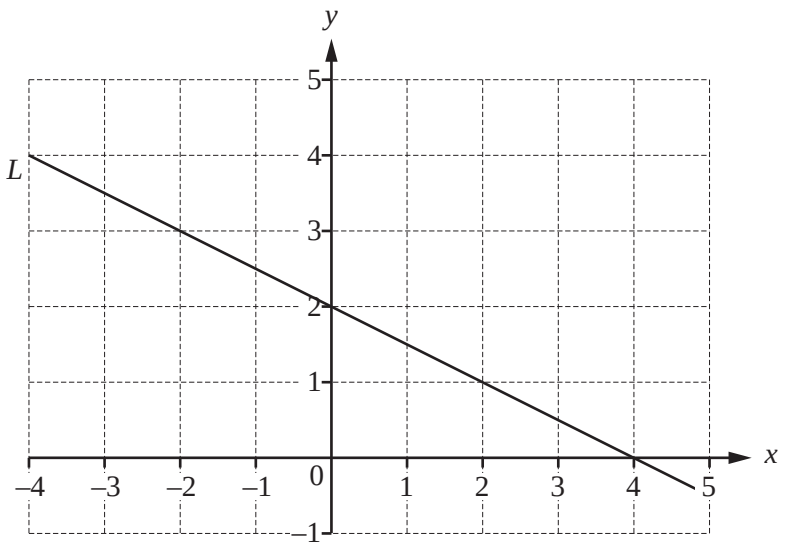
[4]

(iii) On the grid, draw the line $y = -5$. [1]

(iv) Use your graph to solve the equation $\frac{12}{x} = -5$.

$x =$ ..... [1]

(b) Line L is drawn on the grid.



(i) Find the gradient of line L.

..... [2]

(ii) Find the equation of line L in the form $y = mx + c$.

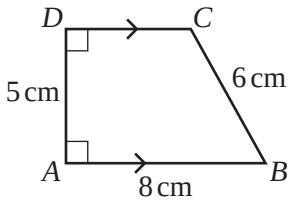
$y =$ ..... [1]

(iii) Line M is parallel to line L.
Line M passes through the point (0, 3).

Write down the equation of line M.

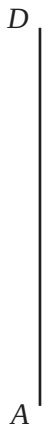
$y =$ ..... [2]

8 **(a)** The diagram shows a trapezium *ABCD*.



NOT TO SCALE

(i) Draw accurately trapezium *ABCD*.
Side *AD* has been drawn for you.



[2]

(ii) Measure the size of the obtuse angle.

..... [1]

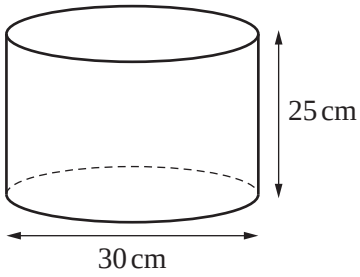
(iii) Measure the length of *CD* in centimetres.

..... cm [1]

(iv) Calculate the area of trapezium *ABCD*.

..... cm^2 [2]

(b)



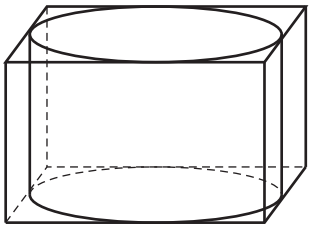
NOT TO SCALE

The diagram shows a cylinder with diameter 30 cm and height 25 cm.

(i) Calculate the volume of the cylinder.

.....cm^3 [3]

(ii) The cylinder is placed inside a cuboid.
The cylinder touches all the faces of the cuboid.



NOT TO SCALE

Calculate the surface area of the cuboid.

.....cm^2 [3]

Question 9 is printed on the next page.

9 **(a)** Factorise.

$y^2 + 8y$

..... [1]

(b) Expand the brackets and simplify.

$3(2x - 1) - 4(x - 5)$

..... [2]

(c) Make p the subject of the formula $k = 5m + 7p$.

$p =$ ..... [2]

(d) Solve the simultaneous equations.
You must show all your working.

$3x + 2y = 6$
$2x - 3y = 17$

$x =$ .....

$y =$ ..... [4]

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