Cambridge IGCSE

**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

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**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 $\pi$, 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.

View solution

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

..... [1]

**(ii)** The hats are made in the ratio

View solution

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.

View solution

Work out how many hats she sells.

..... [1]

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

View solution

| 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%.

View solution

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.

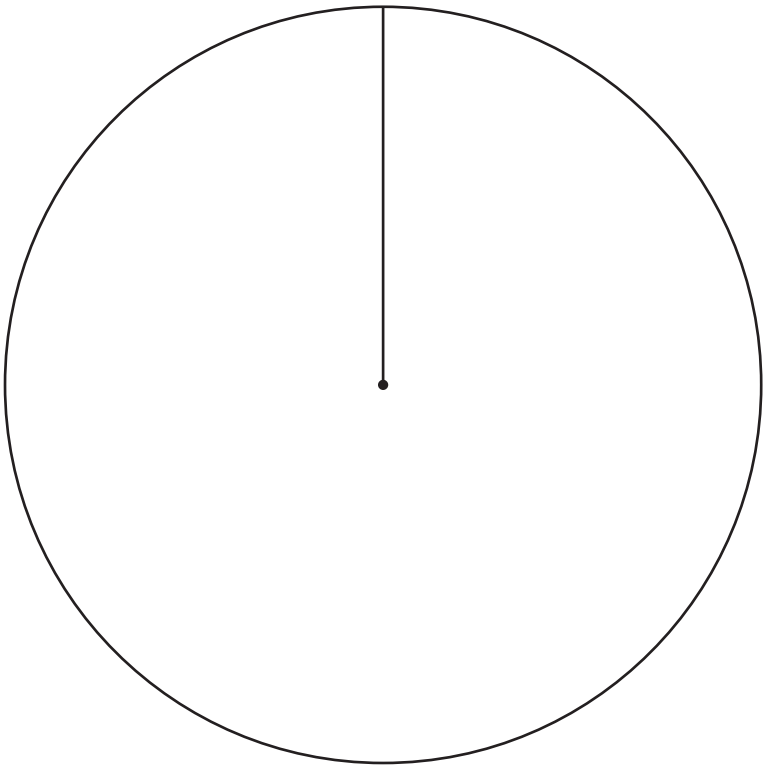
View solution

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

**(i)** Complete the table. [2]

**(ii)** Complete the pie chart.

View solution



[2]

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

View solution

Work out her percentage profit.

.....% [3]

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

View solution

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

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

**(b)** Find the value of

View solution

**(i)** $\sqrt{1.96}$,

..... [1]

**(ii)** $16^3$.

View solution

..... [1]

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

View solution

Give your answer correct to 2 significant figures.

..... [2]

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

View solution

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

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

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

View solution

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

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

View solution

**(i)** Work out the value of $T$.

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

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

View solution

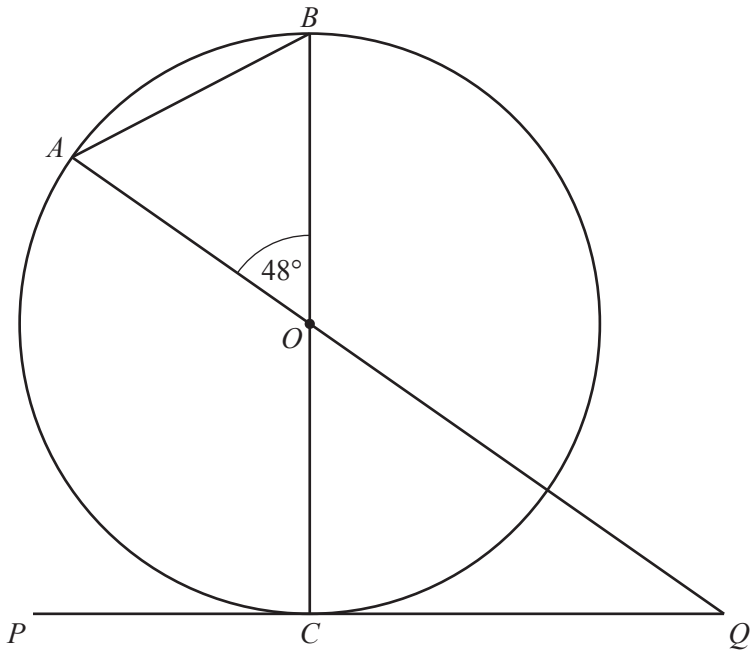
..... [2]

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

View solution

..... [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*.

View solution

..... [1]

**(b)** Find the size of

**(i)** angle *COQ*,

View solution

Angle *COQ* = ..... [1]

**(ii)** angle *ABO*,

View solution

Angle *ABO* = ..... [2]

**(iii)** angle *OQC*.

View solution

Angle *OQC* = ..... [2]

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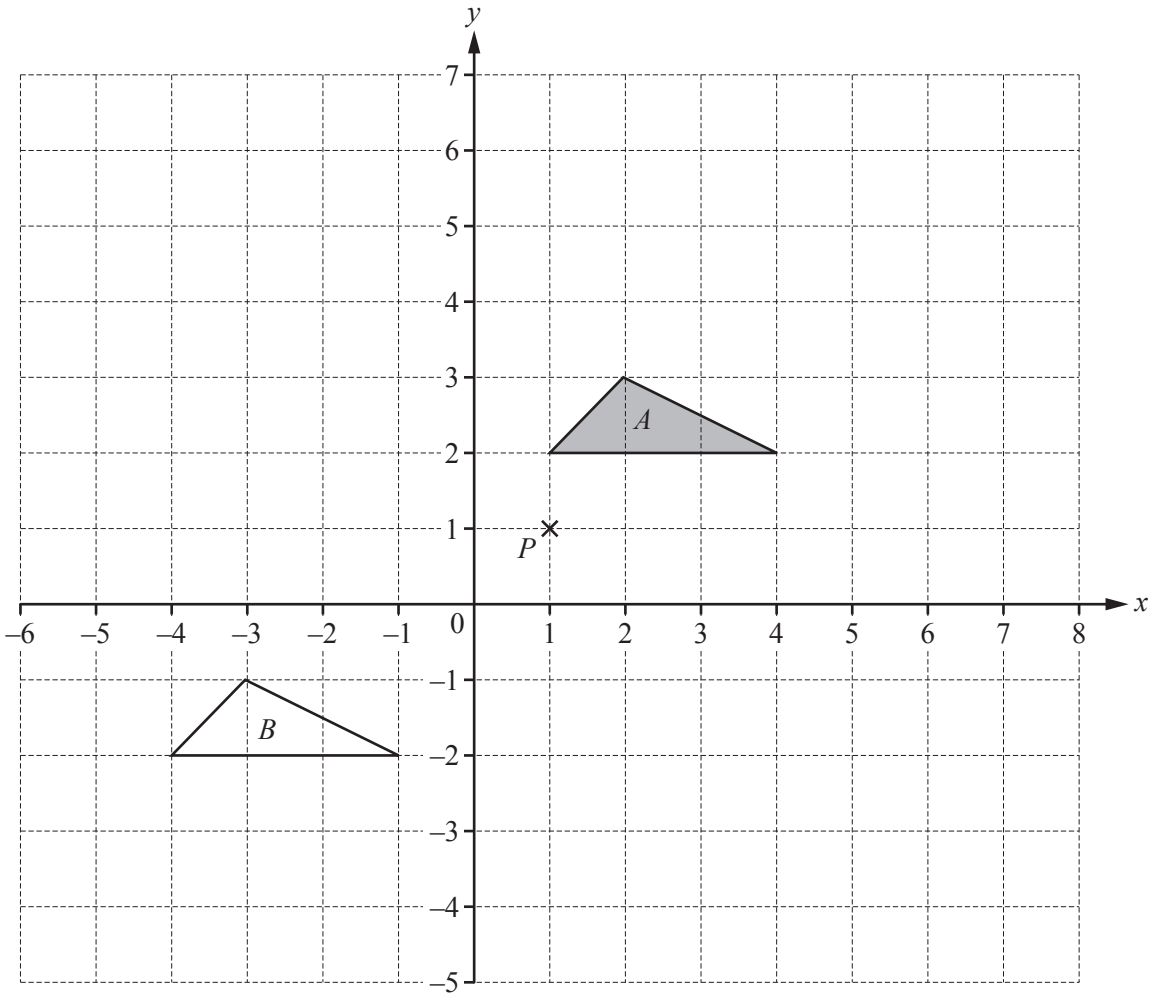
**4** The diagram shows two triangles $A$ and $B$ and point $P$ on a 1 cm$^2$ grid.




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

View solution

..... [1]

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

View solution

.....

..... [2]

**(c)** Rotate triangle $A$ by 90° clockwise about (0, 0). View solution [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. View solution

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

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

View solution

**(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]

View solution

**(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]

View solution

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

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

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

View solution

**(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.

View solution

**(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.

View solution




[1]

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

View solution

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.

View solution

Complete the statement about the value of $m$.

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

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

View solution

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.

View solution

..... km [1]

**(iii)** Calculate the mean.

View solution

..... 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.

View solution

Work out the time he finishes.

..... [2]

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

View solution

.....m/min [2]

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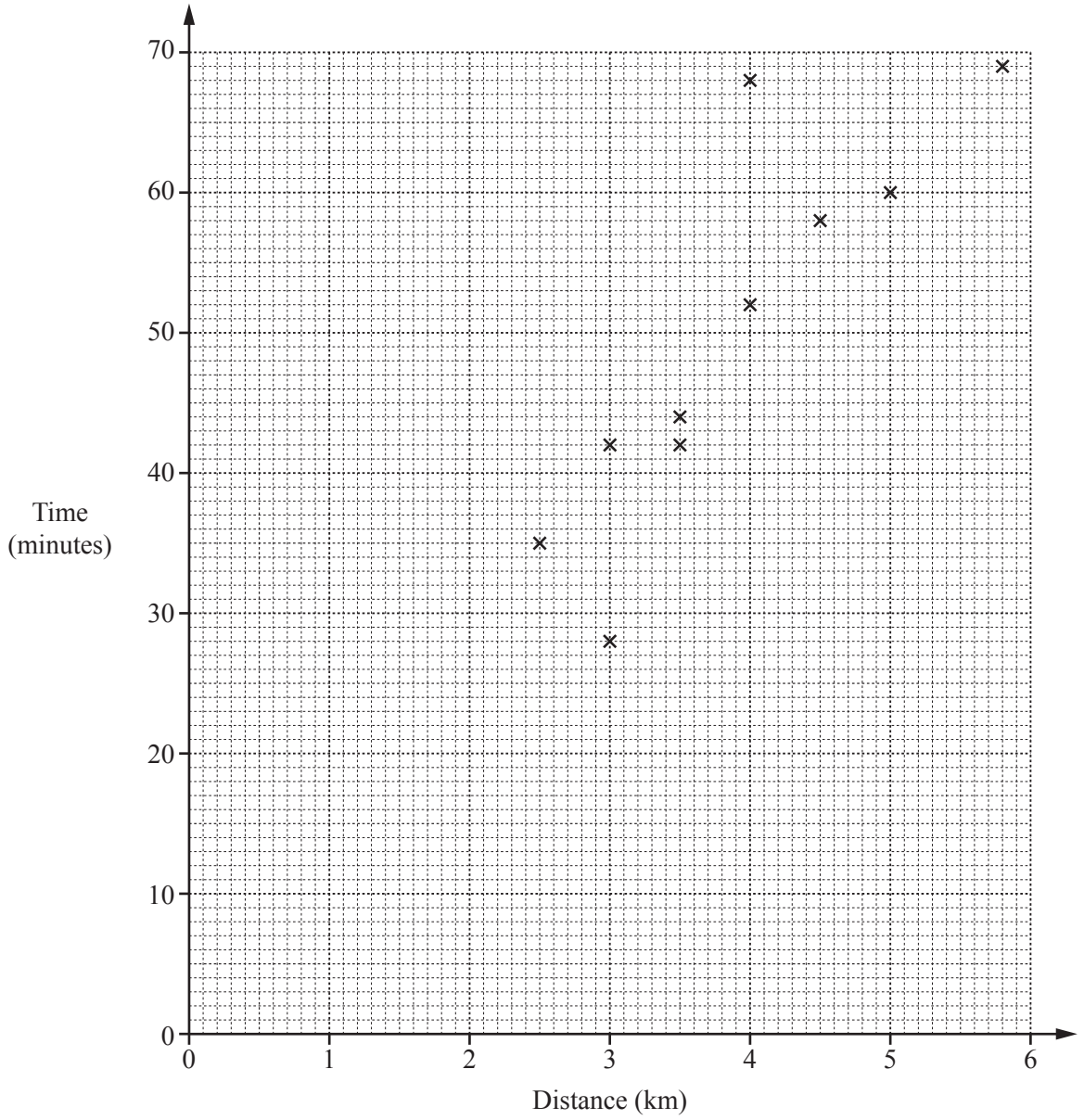
**(c)** For another 10 days, Luca records the distance he walks each day and the time it takes. The scatter diagram shows this information.

View solution




**(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]

View solution

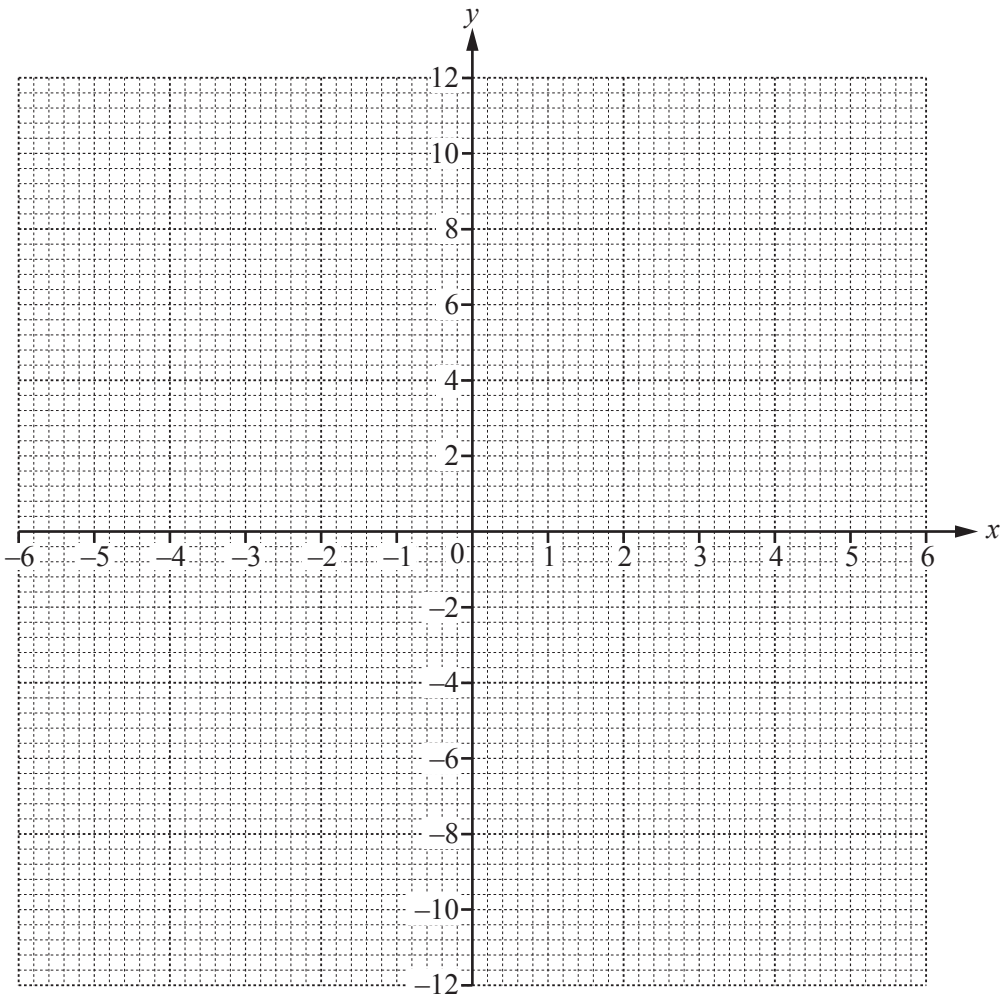
View solution

**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]

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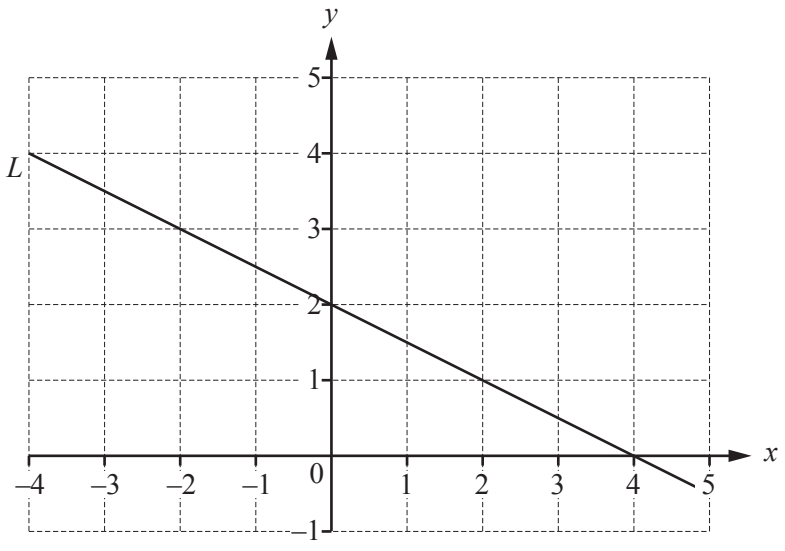
**(b)** Line $L$ is drawn on the grid.

View solution




**(i)** Find the gradient of line $L$.

..... [2]

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

View solution

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

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

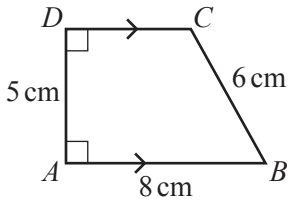
View solution

Write down the equation of line $M$.

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

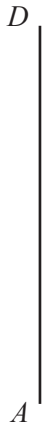
**8** **(a)** The diagram shows a trapezium $ABCD$.

View solution




NOT TO SCALE

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




[2]

**(ii)** Measure the size of the obtuse angle.

View solution

..... [1]

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

View solution

..... cm [1]

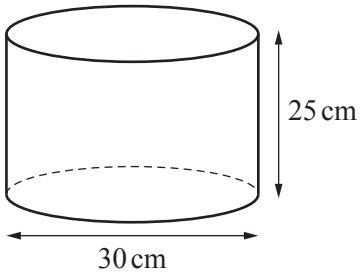
**(iv)** Calculate the area of trapezium $ABCD$.

View solution

..... $cm^2$ [2]

**(b)**

View solution




NOT TO SCALE

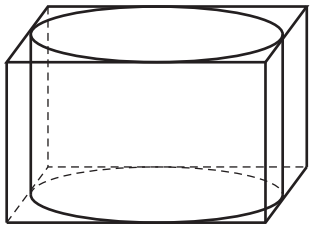
The diagram shows a cylinder with diameter 30 cm and height 25 cm.

**(i)** Calculate the volume of the cylinder.

.....$cm^3$ [3]

View solution

**(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.

$y^2 + 8y$

View solution

..... [1]

**(b)** Expand the brackets and simplify.

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

View solution

..... [2]

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

View solution

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

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

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

View solution

$x =$ .....

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

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