Cambridge IGCSE

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

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|---|---|---|---|---|---|---|---|---|---|
| CANDIDATE NAME | | | | | | | | | |
| CENTRE NUMBER | | | | | | CANDIDATE NUMBER | | | | |

*6677619481 8*

**MATHEMATICS** **0580/32**

Paper 3 (Core) **October/November 2016**

**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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

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CAMBRIDGE International Examinations

**[Turn over**

**1** **(a)** A group of 50 children were each asked which type of book they most like to read.
The pictogram shows some of the results.

| Type of book | Number of children |
|---|---|
| Adventure |  |
| Horror | |
| History |  |
| Comedy |  |
| Fantasy |  |

Key:  =4 children

**(i)** How many children said Comedy?

..... [1]

**(ii)** 9 children said they liked Horror best.

Complete the pictogram. [1]

**(iii)** Which type of book was most popular?

..... [1]

**(iv)** One of the children is chosen at random.

Find the probability that they liked History best.

..... [1]

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**(b)** The same 50 children were each asked how many books they had read in the past month. The results are shown in the table.

| Number of books | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Frequency | 7 | 14 | 12 | 5 | 8 | 4 |

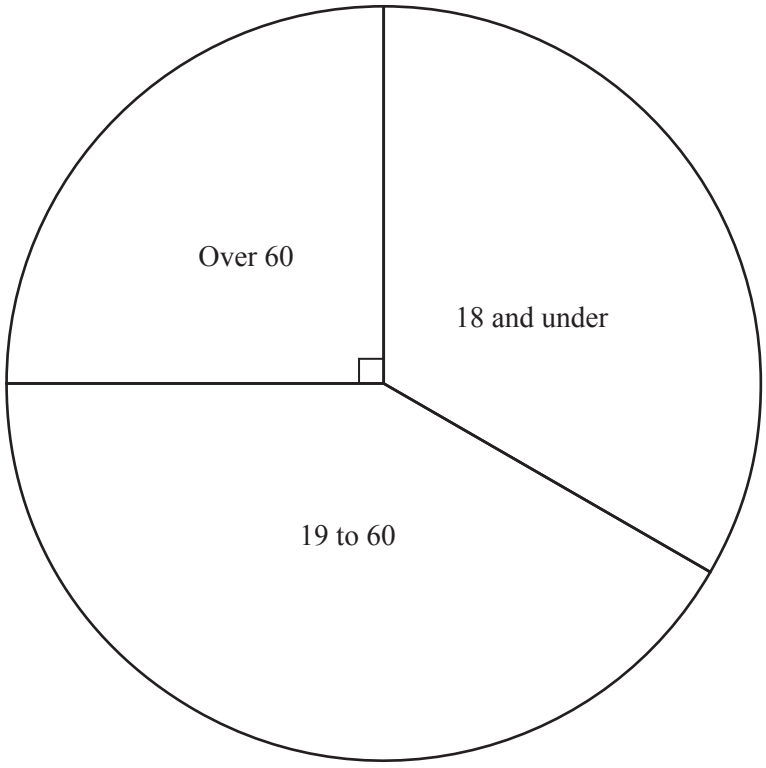
**(i)** Find the median.

..... [2]

**(ii)** Calculate the mean.

..... [3]

**(c)** The ages of 300 people visiting a library one day were recorded. The pie chart shows the results.



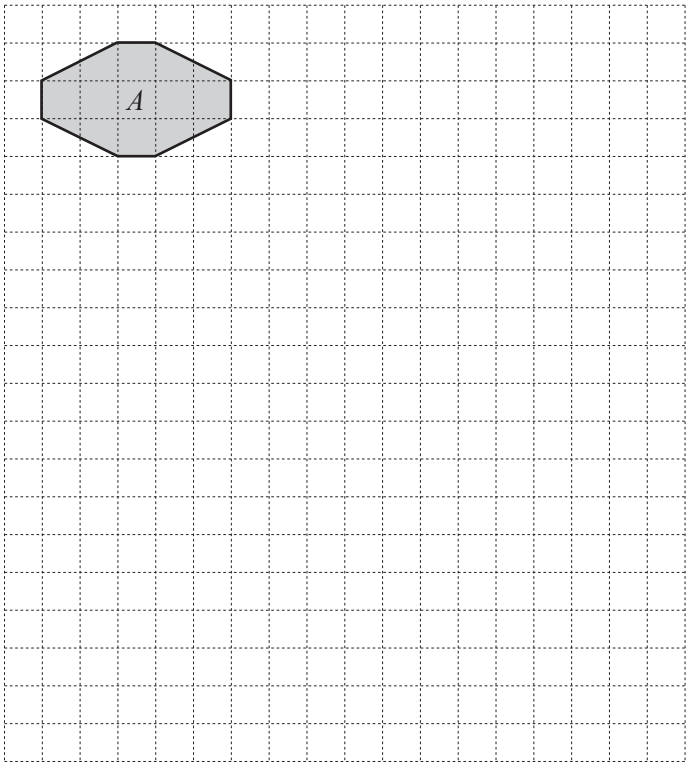

**(i)** What fraction of the people were aged over 60?

..... [1]

**(ii)** How many people were aged 19 to 60?

..... [3]

**2** **(a)** Polygon $A$ is shown on the grid.




**(i)** Write down the mathematical name of polygon $A$.

..... [1]

**(ii)** Write down the order of rotational symmetry of polygon $A$.

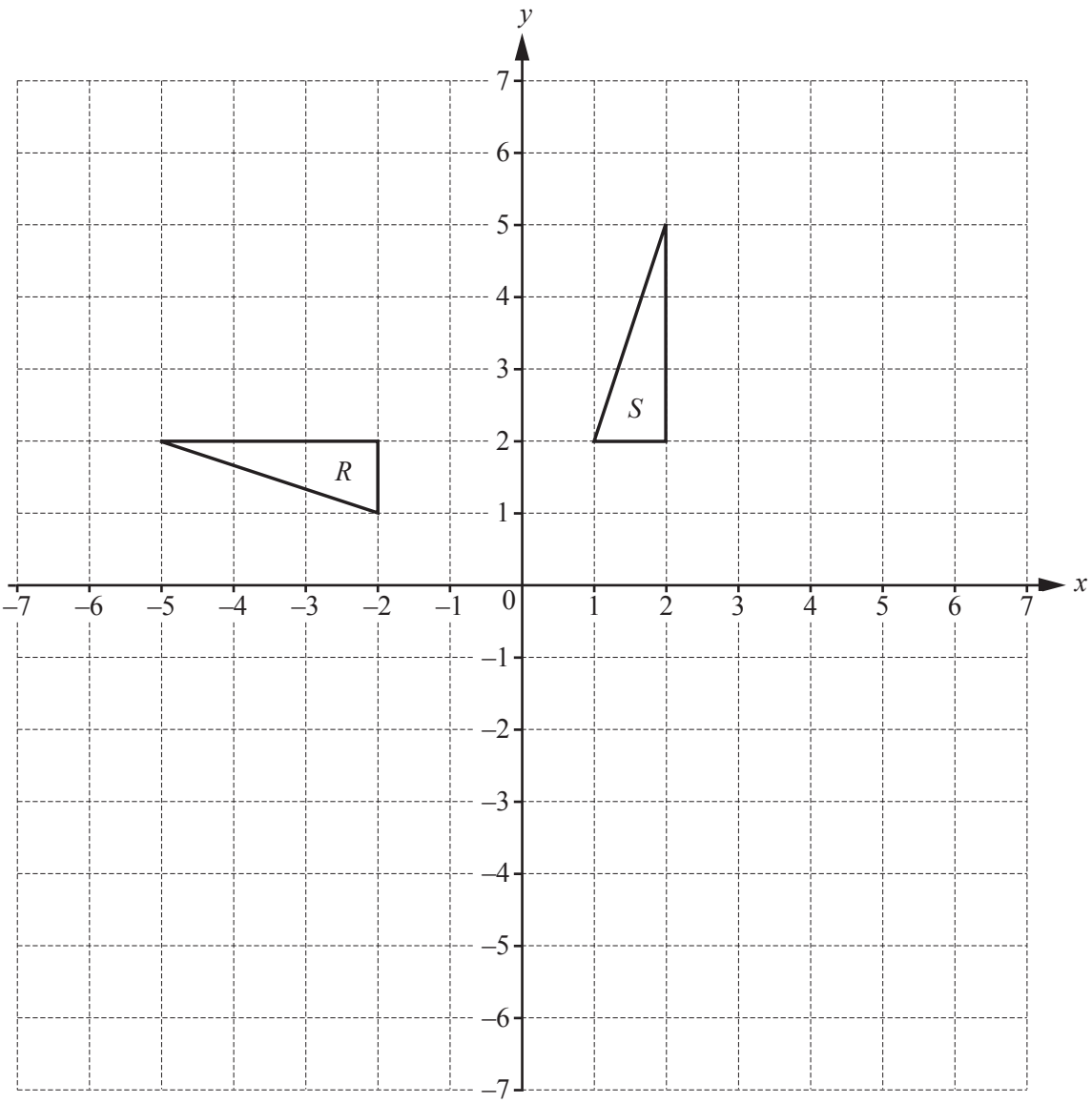
..... [1]

**(iii)** Polygon $A$ is enlarged by scale factor 3 to give polygon $B$.

Draw polygon $B$ on the grid. [2]

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**(b)** Triangle *R* and triangle *S* are shown on the grid.




**(i)** Describe fully the **single** transformation that maps triangle *R* onto triangle *S*.

.....

..... [3]

**(ii)** Reflect **triangle *R*** in the *x*-axis. [1]

**(iii)** Translate **triangle *S*** by the vector $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$. [2]

**3** **(a)** Tariq wants to buy some orange juice.
He sees these offers in a shop.

| **Offer A** | **Offer B** | **Offer C** |
|---|---|---|
| 1-litre carton | 2-litre carton | Pack of 4 1-litre cartons |
| $0.65 | $1.25 | $2.56 |

Work out the lowest amount Tariq could pay for 5 litres of orange juice.
Show how you decide.

Tariq buys ..... cartons.

The lowest amount is $..... [3]

**(b)** Bottle *P* contains 1.5 litres of lemonade.
Bottle *Q* contains $\frac{1}{3}$ more lemonade than bottle *P*.

Work out how much lemonade is in bottle *Q*.

..... litres [2]

**(c)** Tariq makes a fruit drink.
He mixes 500 ml of orange juice, 200 ml of pineapple juice and 1 litre of lemonade.

**(i)** Write the ratio orange juice : pineapple juice : lemonade in its simplest form.

..... : ..... : ..... [2]

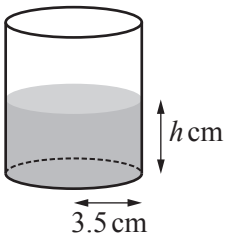
**(ii)** Tariq makes more of this fruit drink.

Work out the total amount of fruit drink he makes when he uses 2 litres of orange juice.
Give your answer in litres.

..... litres [3]

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**(d)** Tariq pours 300 $cm^3$ of fruit drink into a glass.
The glass is in the shape of a cylinder with radius 3.5 cm.
The height of the drink in the glass is $h$ cm.




NOT TO SCALE

Work out the value of $h$.

$h$ = ..... [2]

**(e)** The capacity of a jug is 750 ml correct to the nearest 10 ml.

Write down the upper and lower bounds of the capacity of the jug.

Upper bound = ..... ml

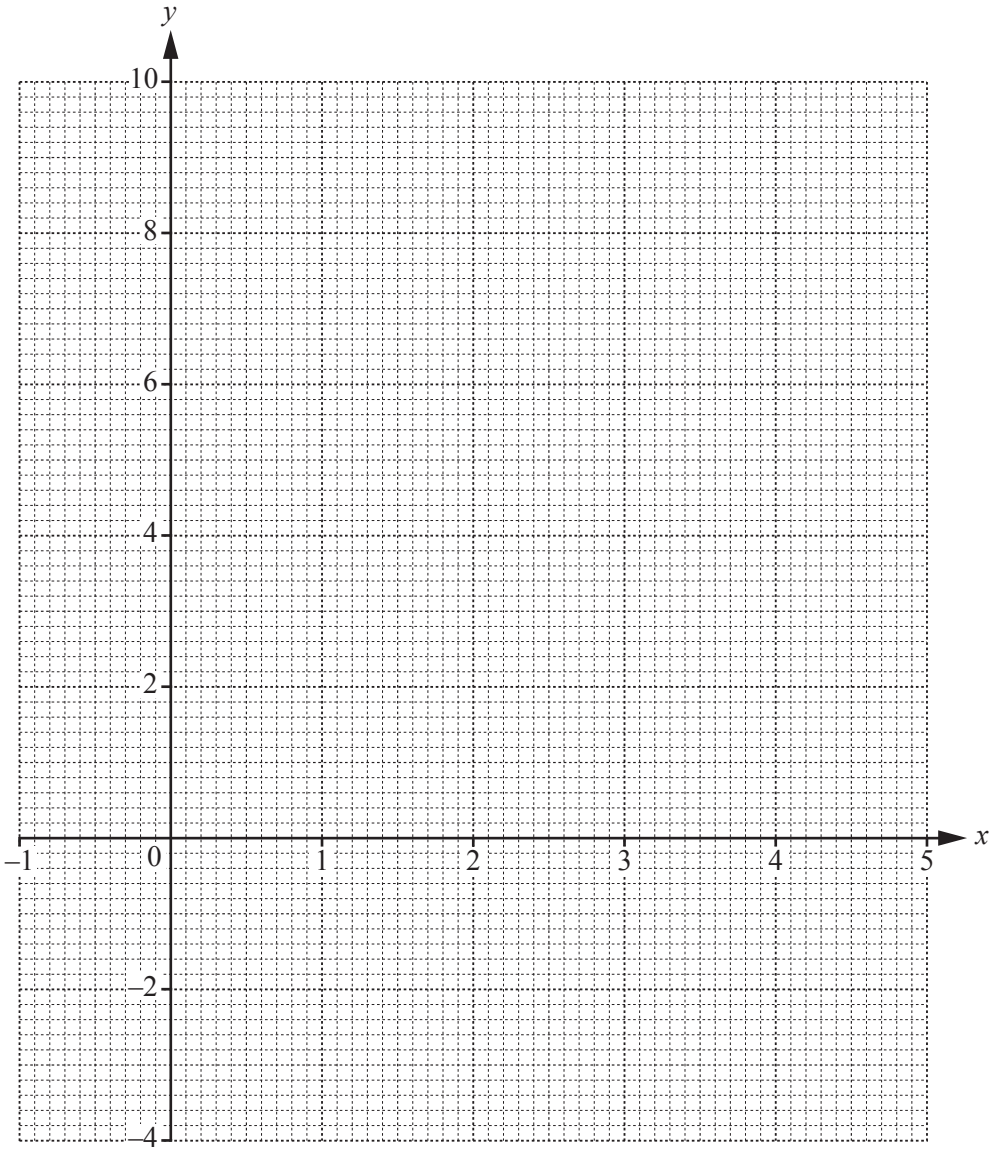
Lower bound = ..... ml [2]

**4** **(a)** Complete the table of values for $y = x^2 - 5x + 3$.

| $x$ | –1 | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| $y$ | | 3 | –1 | | | –1 | 3 |

[2]

**(b)** On the grid, draw the graph of $y = x^2 - 5x + 3$ for $-1 \leqslant x \leqslant 5$.




[4]

**(c)** Write down the equation of the line of symmetry of the graph of $y = x^2 - 5x + 3$.

..... [1]

**(d)** Write down the co-ordinates of the point where the line $y = 4 - x$

**(i)** crosses the $x$-axis,

(..... , .....) [1]

**(ii)** crosses the $y$-axis.

(..... , .....) [1]

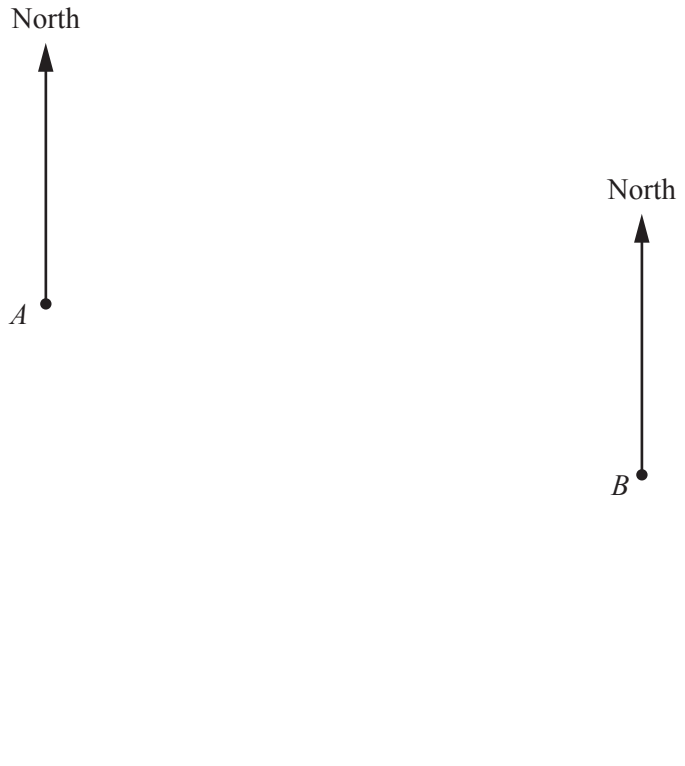
**(e)** On the grid, draw the line $y = 4 - x$. [1]

**(f)** Write down the co-ordinates of the points of intersection of the graph of $y = x^2 - 5x + 3$ and the line $y = 4 - x$.

(..... , .....)

(..... , .....) [2]

**5** **(a)** The scale drawing shows the positions of three villages, *A*, *B* and *C*.
The scale is 1 centimetre represents 5 kilometres.




Scale: 1 cm to 5 km

**(i)** Find the actual distance between village *A* and village *B*.

..... km [2]

**(ii)** Measure the bearing of *B* from *A*.

..... [1]

**(iii)** Another village, *D*, is 30 km from village *B* on a bearing of 215°.

On the scale drawing, mark the position of village *D*. [2]

**(iv)** A power station, *P*, is 25 km from village *C*.
It is equidistant from village *A* and village *B*.

**Using a ruler and compasses only**, construct and mark a position of the power station, *P*. [3]

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**(b)** A bus takes workers from village *C* to the power station.
Each journey takes 35 minutes.

**(i)** Complete the timetable for the bus.

| | | | |
|---|---|---|---|
| Village *C* | 05 45 | | |
| Power station | | 06 50 | 08 05 |

[3]

**(ii)** The bus travels 25 km from village *C* to the power station.

Calculate the average speed of the bus in kilometres per hour.

..... km/h [2]

**6** **(a)** Write down a factor of 24 that is a square number.

..... [2]

**(b)** Write down the cube number between 100 and 200.

..... [1]

**(c)** Find

**(i)** $\sqrt{12.25}$,

..... [1]

**(ii)** $17^3$,

..... [1]

**(iii)** $4^{-2}$.

..... [1]

**(d)** $s = \frac{1}{2}at^2$

Find the value of $s$ when $a = 0.7$ and $t = 4.2$ .

$s =$ ..... [2]

**(e)** Simplify.

**(i)** $a^0$

..... [1]

**(ii)** $b^3 \times b^2$

..... [1]

**(iii)** $\frac{c^4}{c^8}$

..... [1]

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**7** **(a)** Mei is paid $15.25 for each hour she works.

**(i)** Work out how much she is paid when she works for 8 hours.

$ ..... [1]

**(ii)** Mei gets a pay increase.
She is paid 8% more for each hour she works.
Mei works for 38 hours each week.

Work out how much Mei earns each week after the pay increase.

$ ..... [3]

**(b)** Xia works in France.
She is paid 425 euros each week.
The exchange rate between euros (€) and dollars is €1 = $1.45 .

Work out who earns more each week, Mei or Xia, and by how much.
Give your answer in dollars.

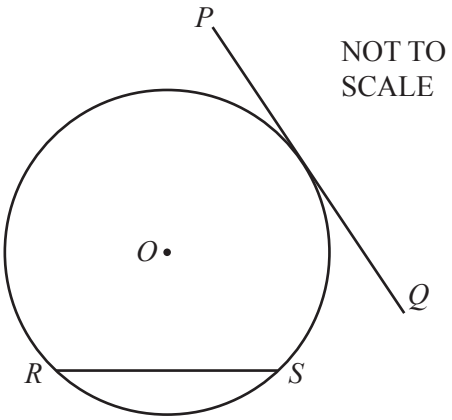
..... earns more by $ ..... [3]

**(c)** Mei invests $500 in a bank at a rate of 3.5% per year compound interest.

Calculate the **total** amount of money she will receive at the end of 3 years.

$ ..... [3]

**8 (a)**




The diagram shows a circle, centre $O$, and lines $PQ$ and $RS$.

Write down the mathematical name for

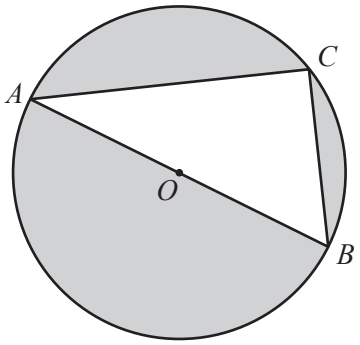
**(i)** line $PQ$,

..... [1]

**(ii)** line $RS$.

..... [1]

**(b)**




$A$, $B$ and $C$ are points on the circle, centre $O$.

**(i)** Complete the statement.

Angle $ACB = 90°$ because ..... [1]

**(ii)** $AC = 8$ cm and $BC = 5$ cm.

Calculate the area of triangle $ABC$.

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

**(iii)** Show that the diameter of the circle is 9.43 cm, correct to 2 decimal places.

[2]

**(iv)** Calculate the area of the circle.

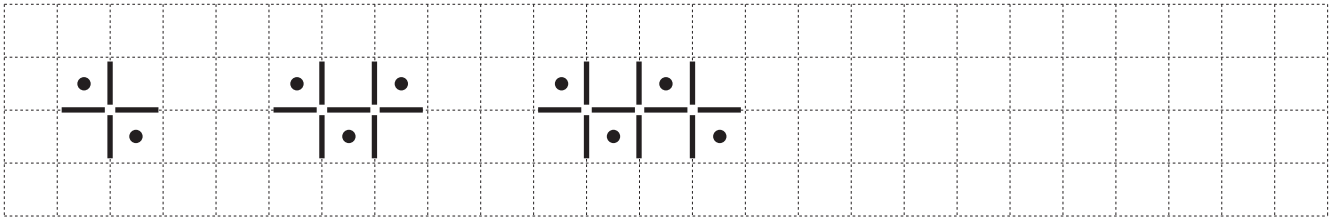
.....$cm^2$ [2]

**(v)** Calculate the percentage of the circle that is shaded.

..... % [2]

**Question 9 is printed on the next page.**

**9** A sequence of patterns is made from lines and dots.
The first three patterns in the sequence are shown.



Pattern 1 Pattern 2 Pattern 3 Pattern 4

**(a)** Draw Pattern 4 on the grid. [1]

**(b)** Complete the table.

| Pattern | 1 | 2 | 3 | 4 | | 10 |
|---|---|---|---|---|---|---|
| Number of dots | 2 | 3 | | | | |
| Number of lines | 4 | 7 | | | | |

[4]

**(c)** Find an expression, in terms of $n$, for

**(i)** the number of dots in Pattern $n$,

..... [1]

**(ii)** the number of lines in Pattern $n$.

..... [2]

**(d)** One of these patterns has 76 lines.

Work out how many **dots** are in this pattern.

..... [2]

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