GCSE

4353/01

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S16-4353-01

MATHEMATICS (UNITISED SCHEME)
UNIT 3: Calculator-Allowed Mathematics
FOUNDATION TIER

A.M. TUESDAY, 14 June 2016

1 hour 30 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

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

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **7**.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	2	
2.	4	
3.	7	
4.	5	
5.	4	
6.	2	
7.	7	
8.	4	
9.	4	
10.	5	
11.	5	
12.	5	
13.	4	
14.	5	
15.	5	
16.	5	
17.	2	
18.	2	
19.	3	
Total	80	

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Formula List

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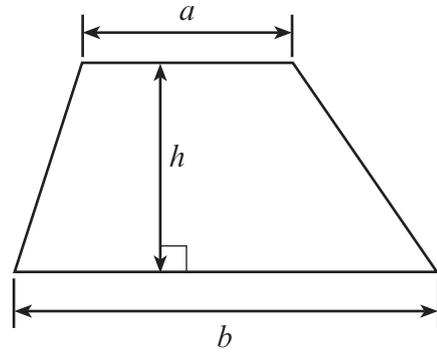
Volume of prism = area of cross-section × length

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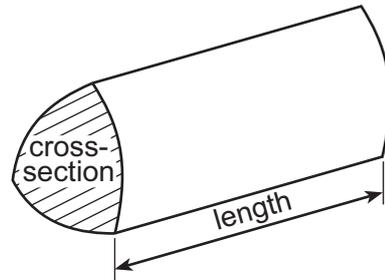
1. In 2011, Government Statistics showed the number of people in Wales who were able to speak Welsh and the number who were not able to speak Welsh.

In each case, write the number of people correct to the nearest thousand. [2]

	Number of people	Number of people correct to the nearest thousand
Able to speak Welsh	562 016	
Not able to speak Welsh	2 393 825	

2. The solid below is made from small cubes, each with length, width and height of 1 cm.
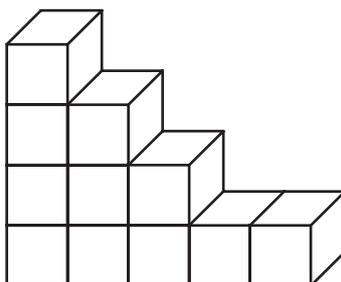
Diagram not drawn to scale

(a) What is the volume of the solid? Give the units of your answer. [2]

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(b) The **whole solid** is dropped into a tin of red paint.
What area will be covered with red paint? [2]

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3. Adam was buying items for his new puppy from a pet store.

(a) Complete his bill. [3]

Items	Cost
2 bags of "Woof" dry dog food @ £12.87 per bag	£
12 tins of "Waggy-tail" dog meat @ 60p each	£
1 dog bowl	£
Total	£ 41.69

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(b)

TODAY'S SPECIAL
Spend £50 and get a free bag of "Doggy Treats".

How much more money would Adam need to spend in order to get a free bag of "Doggy Treats"? [1]

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(c) Adam knew that "Woof" dry dog food cost £12.87 for a bag weighing 3 kg.

   (i) What was the cost per kilogram of "Woof" dry dog food? [1]

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   (ii) The same type of dry dog food could be purchased in 10 kg economy bags costing £36.50 each.
How much cheaper, per kilogram, was an economy bag than a 3 kg bag? [2]

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4. *(a)* The rectangles below are drawn on a grid of centimetre squares.
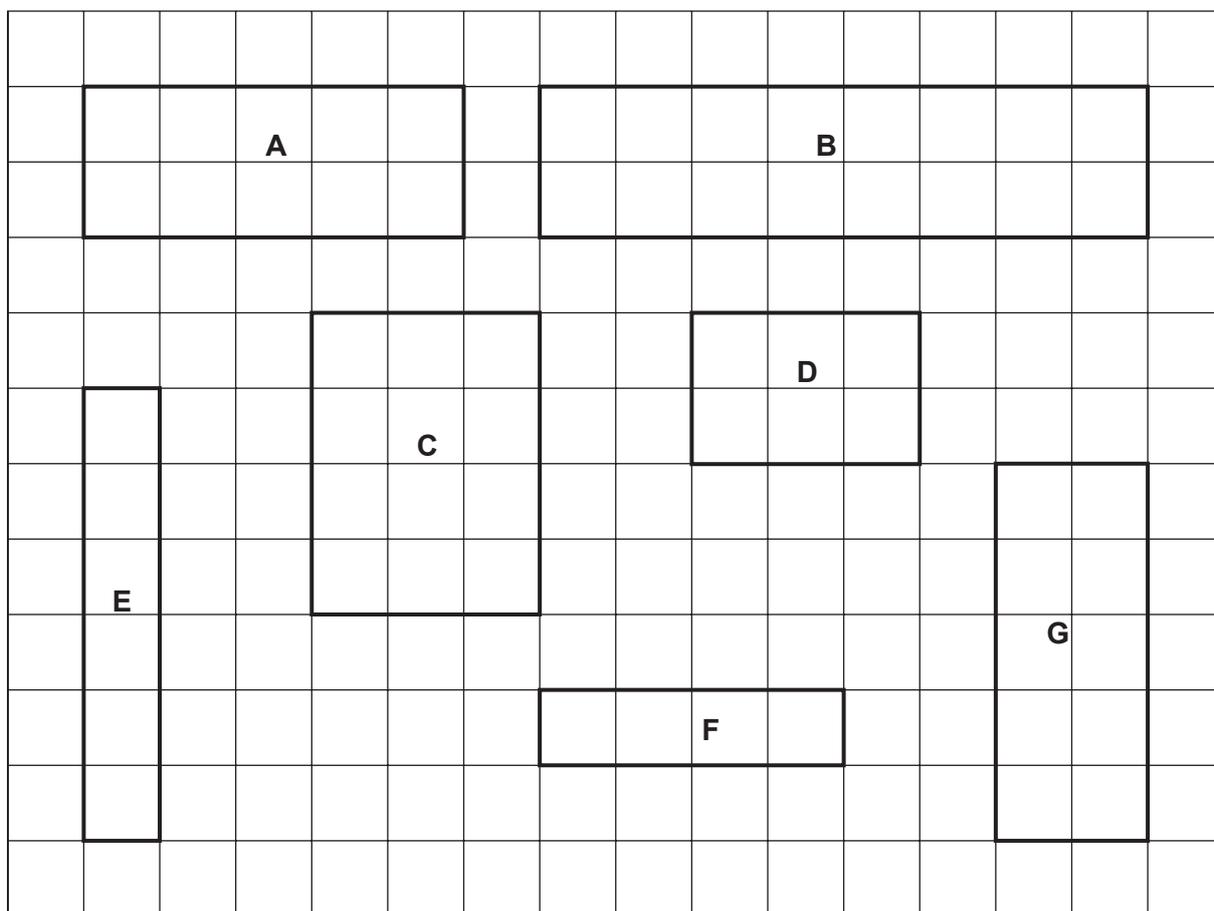
    (i) Write down the letters of two rectangles that are congruent. [1]

    Two rectangles that are congruent are ……………………………… and ………………………………

    (ii) Write down the letters of two rectangles that are not congruent but have the same area. [1]

    Two rectangles that are not congruent but have the same area are ………………………………

    and ………………………………

    (iii) Four of the rectangles have perimeters of equal length. [2]

    Write down the letters of these four rectangles and state the size of the perimeter that they have.

……………………   ……………………   ……………………   …………………… have a perimeter of …………………… cm.

(b)   On the grid below, draw a rectangle that is similar to rectangle **C** but has a larger area.

[1]

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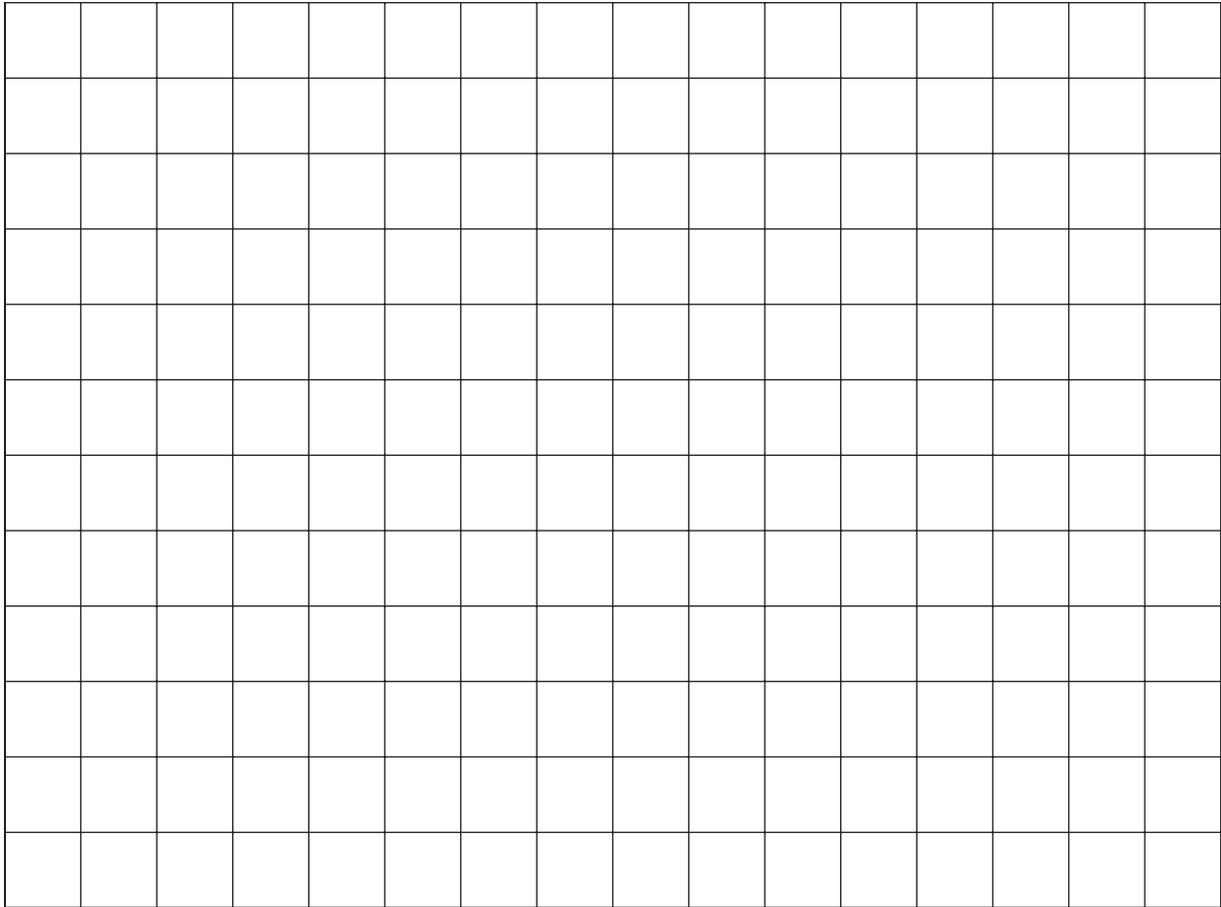
5. Morgan operates a machine that packs bottles of water into boxes.

He has 200 bottles of water to pack into identical boxes.
Each box holds 12 bottles.
He completely fills as many boxes as possible.
How many boxes will he fill and how many bottles will be left over? [4]

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6.

The height of Mount Snowdon is approximately 1100 metres above sea level.
It is known that temperature decreases by 1°C for every 100 metres increase in height.

When the temperature at sea level is 8°C, what is the temperature at the top of the mountain? [2]

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7. *You will be assessed on the quality of your written communication in this question.*

Elinor plans to sell cups of juice at a disco.
She buys 8 bottles of juice.
Each bottle holds 3 litres and costs £3.65 per bottle.
The total cost of the plastic cups she uses is £2.50.
Each plastic cup is filled with 250 ml of juice and is sold for 75p.
Elinor sells all the juice that she has bought.

How much profit does she make? [7]

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8. The pie chart below represents the number of films in each age category shown at a multiscreen cinema. Altogether, 24 films were shown at the cinema.
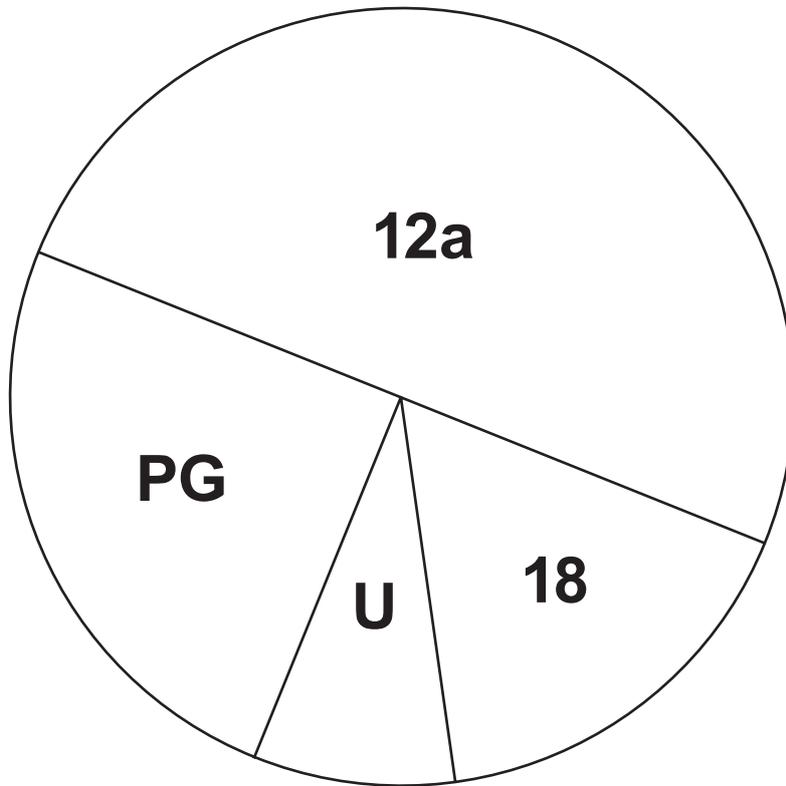
Use this information to complete the pictogram to show the number of films in each age category. [4]

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KEY: = 4 films.

Film Category	
U	
PG	
12a	
18	

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9. James works part-time in a supermarket.

Last week, James worked the following hours:

Day worked	Time recorded
Monday	10:00 to 13:00
Wednesday	14:30 to 17:30
Friday	10:00 to 13:00
Sunday	10:00 to 14:00

He is paid £7.68 per hour for working from Monday to Saturday.

On Sunday, he is paid one and a half times as much per hour.

How much did James earn last week? [4]

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10. *(a)* The diagram below shows a freehand sketch of triangle *XYZ*.
It is not drawn to scale.
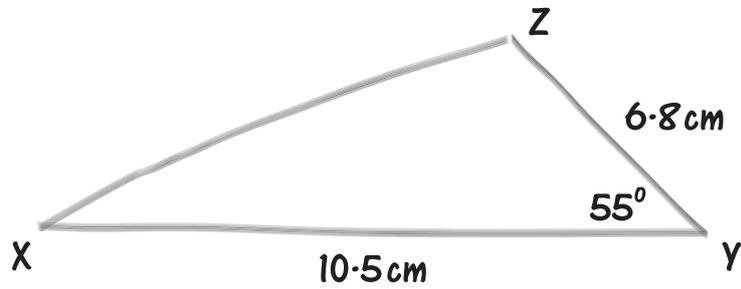
Use a ruler and a protractor to draw an accurate diagram of triangle *XYZ*.
Line *XY* is drawn accurately for you. [3]

X ——————————————————— Y

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(b) Using a ruler and compasses only, construct an equilateral triangle *ABC* of side 8 cm.
Line *AB* is drawn accurately for you.
You must show all your construction arcs. [2]

A ——————————————— *B*

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11. *(a)* x and y are two different numbers taken from the list below.

| 3 | 4 | 5 | 6 | 7 | 8 |

(i) What values of x and y will make $3x - 2y$ equal zero? [1]

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x = ... and y = ...

(ii) Work out the greatest possible value of $3x - 2y$. [1]

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(iii) Work out the least possible value of $3x - 2y$. [1]

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(b) Find the value of $3(a - 2b)$ when $a = -9$ and $b = \dfrac{1}{2}$. [2]

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12. *(a)* Jamal has five bags of carrots.
Each bag weighs a whole number of kilograms.
The median weight of these bags is 3 kg, the range of the weights is 4 kg and the modal weight is 5 kg.
What are the weights of the five bags of carrots? [3]

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The weights of the bags of carrots are:

...................kg   ....kg   ....kg   ....kg   ....kg

(b) Jamal has a number of 3 kg bags of potatoes and a different number of 8 kg bags of potatoes.
The mean weight of the bags of potatoes is 6 kg.
What is the least number of 3 kg and 8 kg bags of potatoes that Jamal has? [2]

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Jamal has .... 3 kg bags and .... 8 kg bags
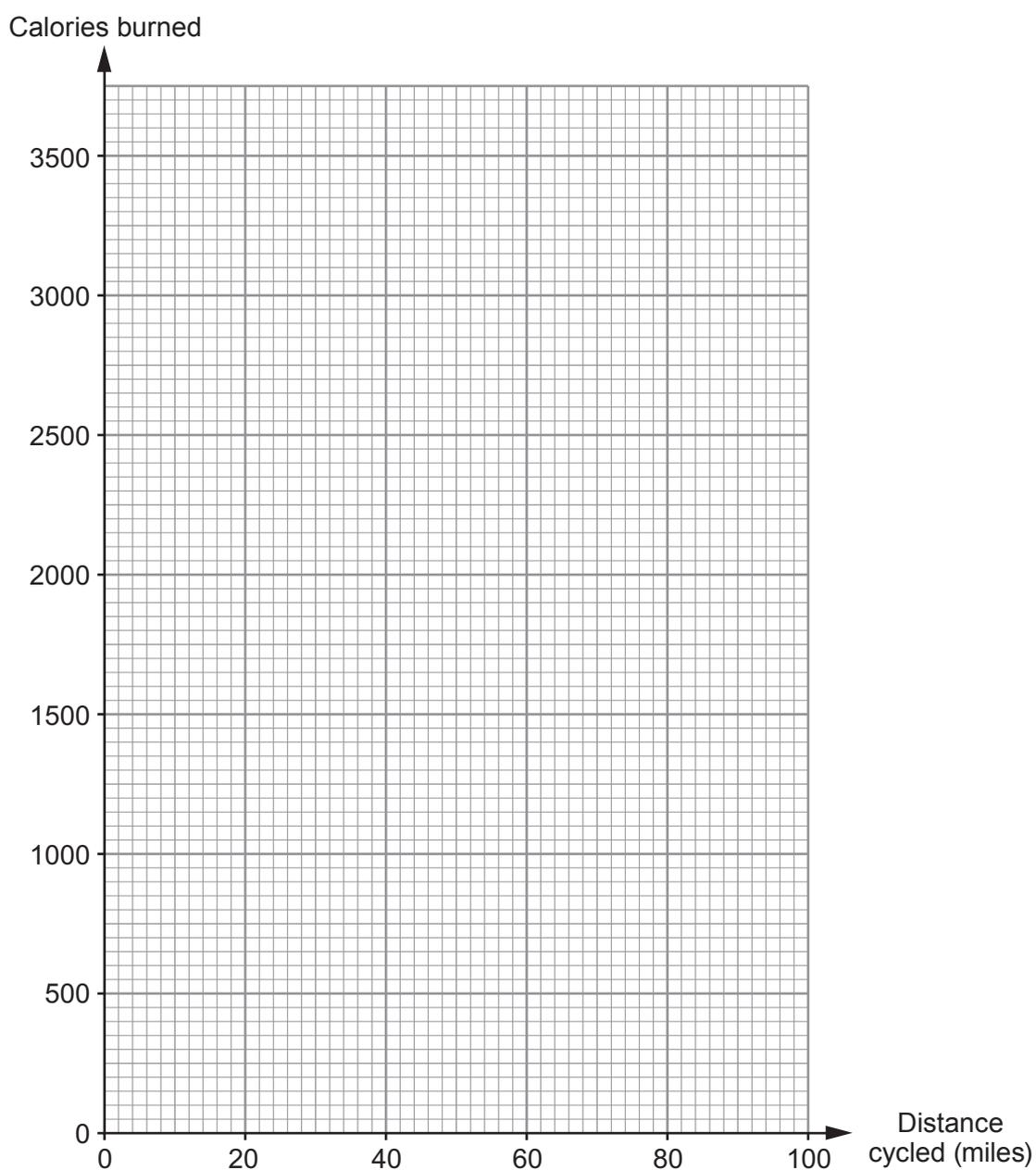
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13. A cyclist used an App on his mobile phone to record the distance he cycled and the calories he
burned, on each of his last six rides.
His results are shown in the table below.

Distance cycled (miles)	60	28	86	52	24	76
Calories burned	2100	1500	3500	2500	800	3000

(a) Draw a scatter diagram of this data. [2]

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(b) What type of correlation is shown in the scatter diagram? [1]

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(c) Give a possible reason why the cyclist burned fewer calories on the 60 mile ride than he
did on the 52 mile ride. [1]

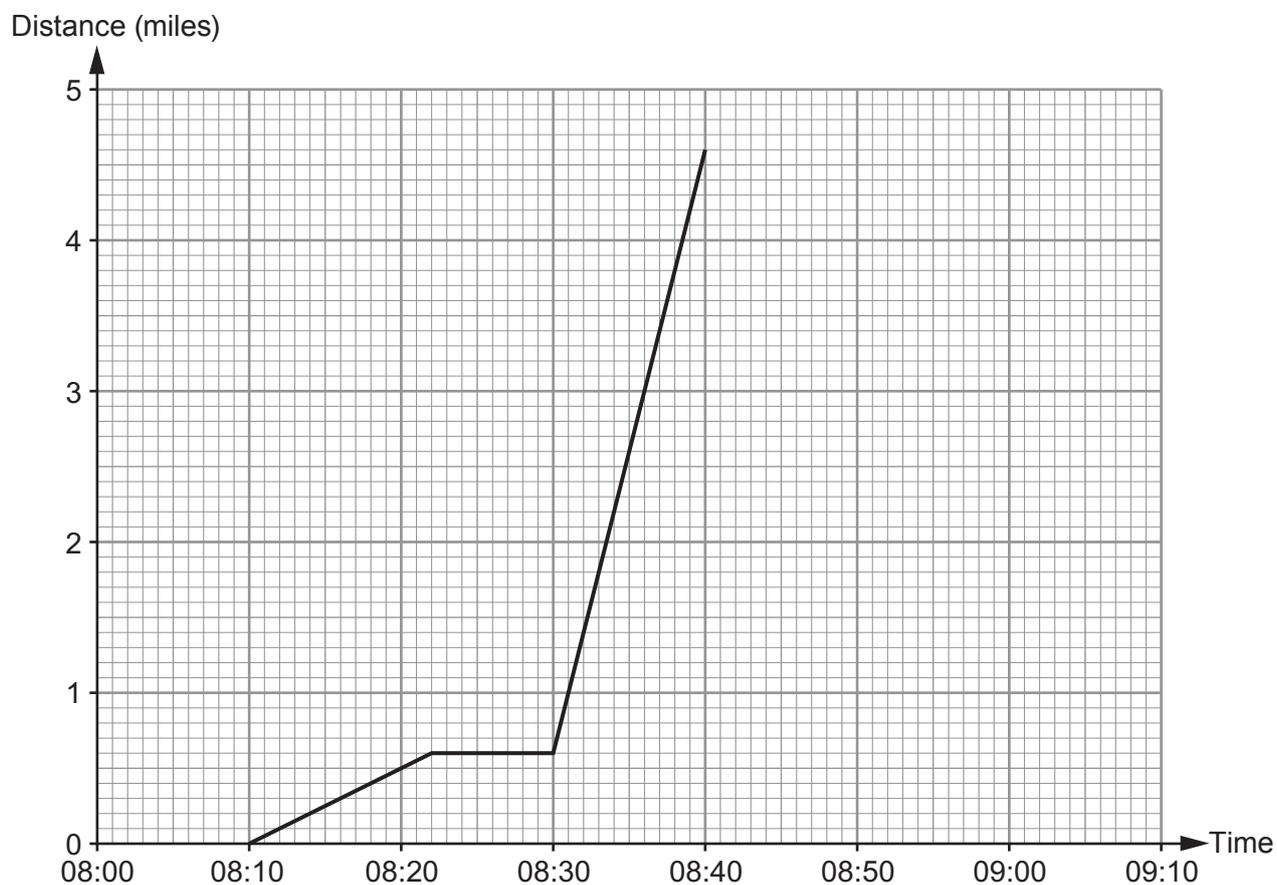..

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14. The graph shows Huw's journey to college.
He leaves home at 08:10. The distance from his home to college is 4·6 miles.
He walks to the bus stop and waits for a bus. He gets on the bus and it takes him to college.

(a) How far is Huw's home from the bus stop? Give your answer in miles. [1]

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(b) How long does Huw wait for the bus? [1]

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(c) At what time does Huw arrive at college? [1]

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(d) Huw's sister Erin goes to the same college.
Erin leaves home at 08:00 and walks to college at a steady speed without stopping.
At 08:35 she is passed by Huw's bus.
Draw Erin's journey on the graph opposite and use this to decide if she will arrive at college before 09:00. [2]

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16. *(a)* Solve the equation $\dfrac{x+5}{6} = 3$. [2]

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(b) Solve the equation $5(2x - 3) - 8x = 10$. [3]

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17. Evaluate $\sqrt[3]{\left(\dfrac{9\cdot8}{3\cdot1-1\cdot7}\right)^2}$. Give your answer correct to 2 decimal places. [2]

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18. A regular polygon has exterior angles of 24°.
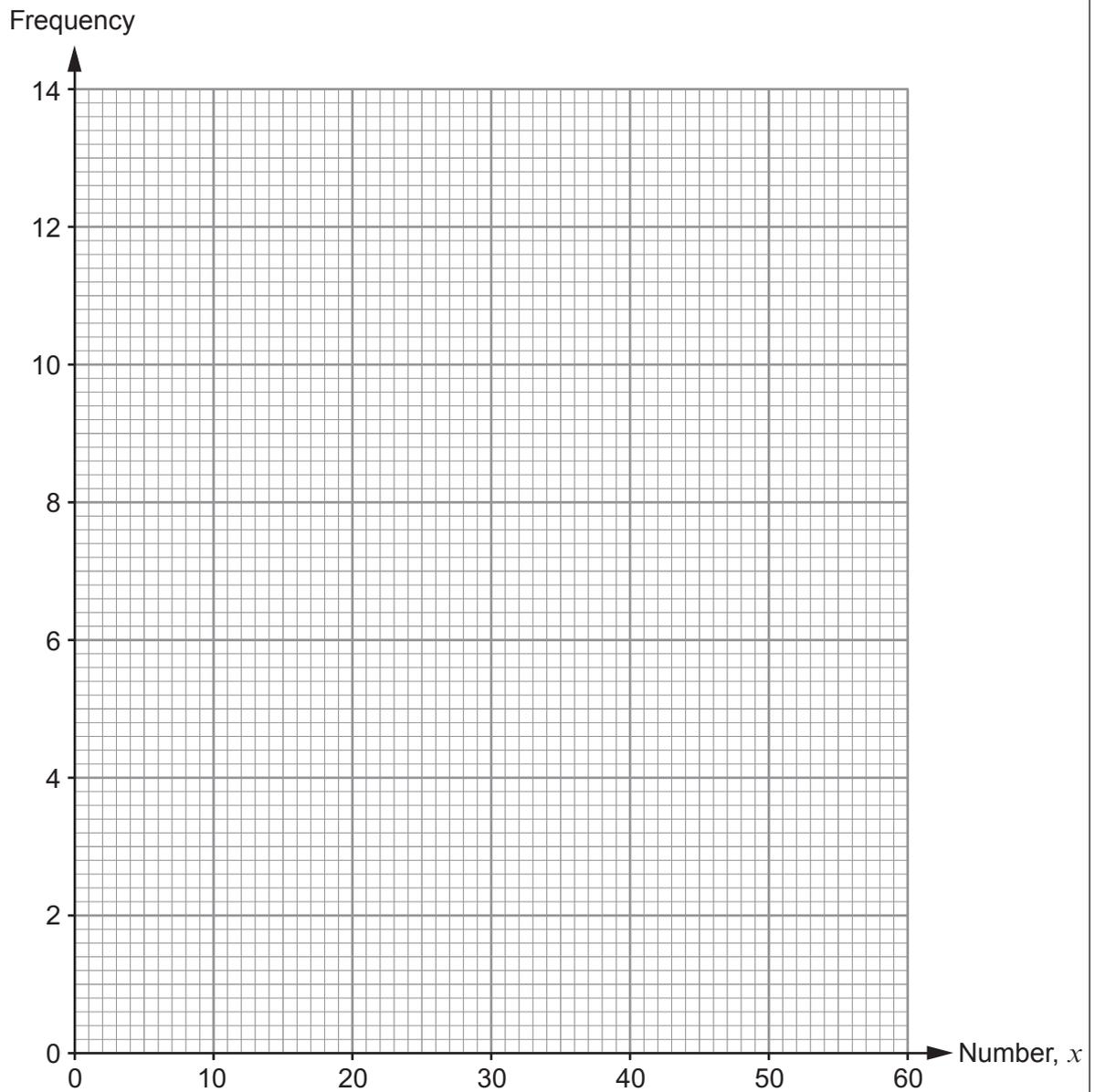How many sides does the regular polygon have? [2]

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19. A list of 50 numbers has been summarised in the grouped frequency table below.

Number, x	Frequency
$0 \leqslant x < 10$	3
$10 \leqslant x < 20$	5
$20 \leqslant x < 30$	9
$30 \leqslant x < 40$	13
$40 \leqslant x < 50$	12
$50 \leqslant x < 60$	8

(a) Draw a frequency polygon to show this data. [2]

(b) Write down the group that contains the median. [1]

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.	Examiner only

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