Use a calculator

1. Mr Smith's bill for servicing his car is £I85.65 including VAT at $17\frac{1}{2}\%$.

How much was his bill before VAT was added?

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Answer £ .....

No calculator

2. Express $0.\dot{3}\dot{6}$ as a fraction in its simplest form.

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Answer .....

3. Show that the sum of **any** three consecutive integers is always a multiple of 3.

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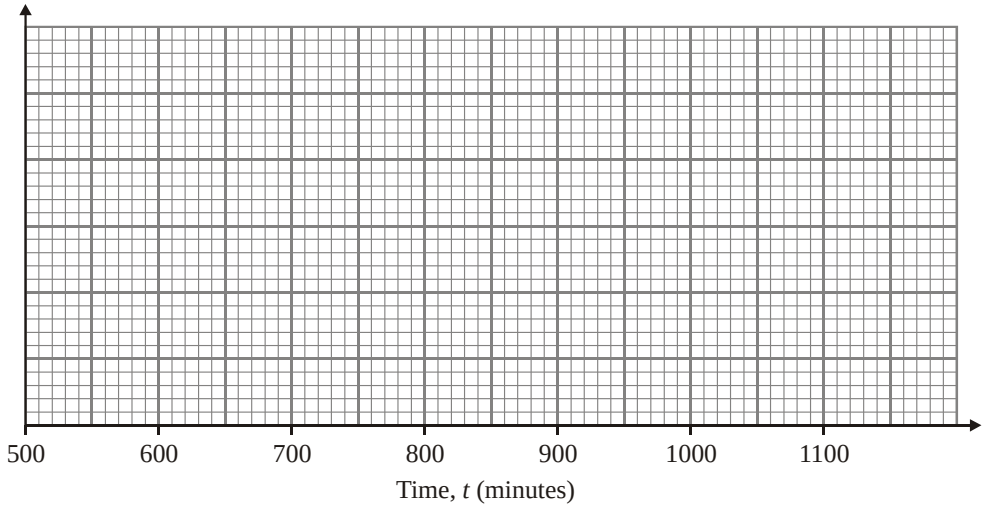
4. Batteries are tested by putting them into toys and seeing how long they last.

Here are the results of 60 tests.

Time, *t* (minutes)	**Frequency**
$500 \le t < 600$	8
$600 \le t < 700$	15
$700 \le t < 750$	10
$750 \le t < 950$	18
$950 \le t < 1150$	9

(a) Draw a histogram to show this information.



(b) Use your histogram, or otherwise, to estimate the median life of a battery.

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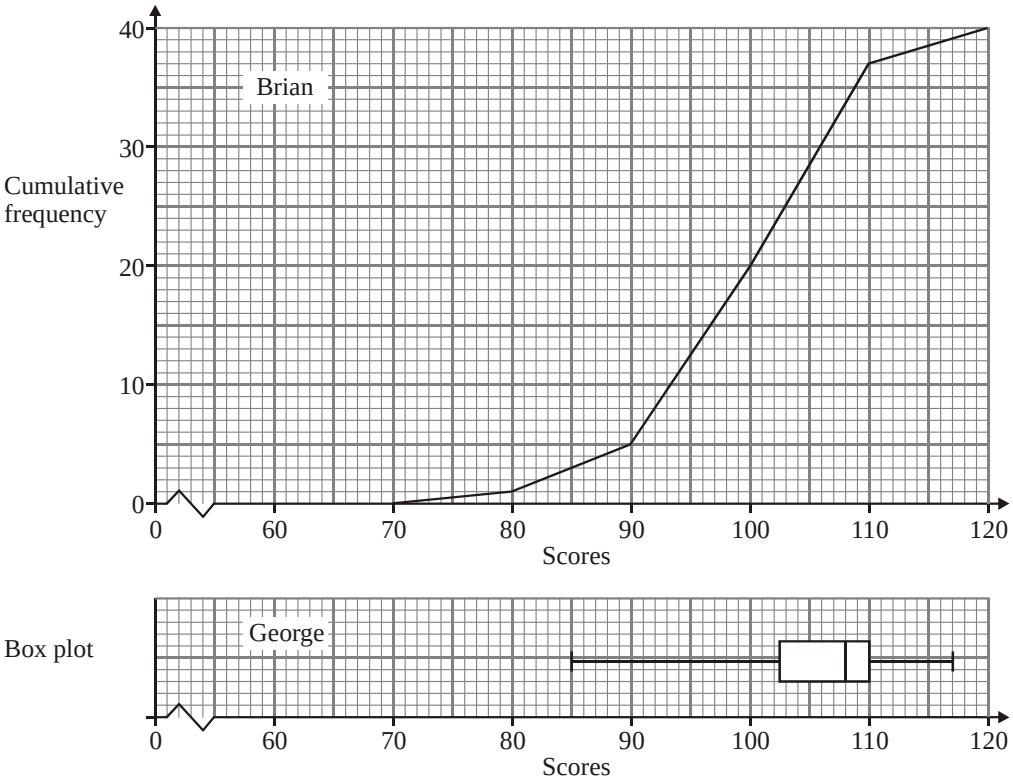
5. Brian and George played 40 games of golf.
The cumulative frequency diagram shows information about Brian's scores.
The box plot shows information about George's scores.



(a) Showing your method clearly, find

(i) Brian's median score

Answer .....

(ii) Brian's inter-quartile range.

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Answer .....

(b) Use the cumulative frequency diagram and the box plot to answer the following.

(i) Which player is the more consistent in his scoring?
Give a reason for your choice.

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(ii) The winner of a game of golf is the player who has the lowest score.
Who do you think is the better player?
Give a reason for your choice.

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6. Emma has a box of counters.
The counters are green, red or blue.
She picks a counter at random.

The table shows the probability that she picks a green counter and the probability that she picks a red counter.

Colour	**Probability**
Green	0.6
Red	0.25
Blue	

(a) What is the probability that Emma picks a blue counter?

Answer .....

(b) There are 10 red counters in the box.

How many green counters are in the box?

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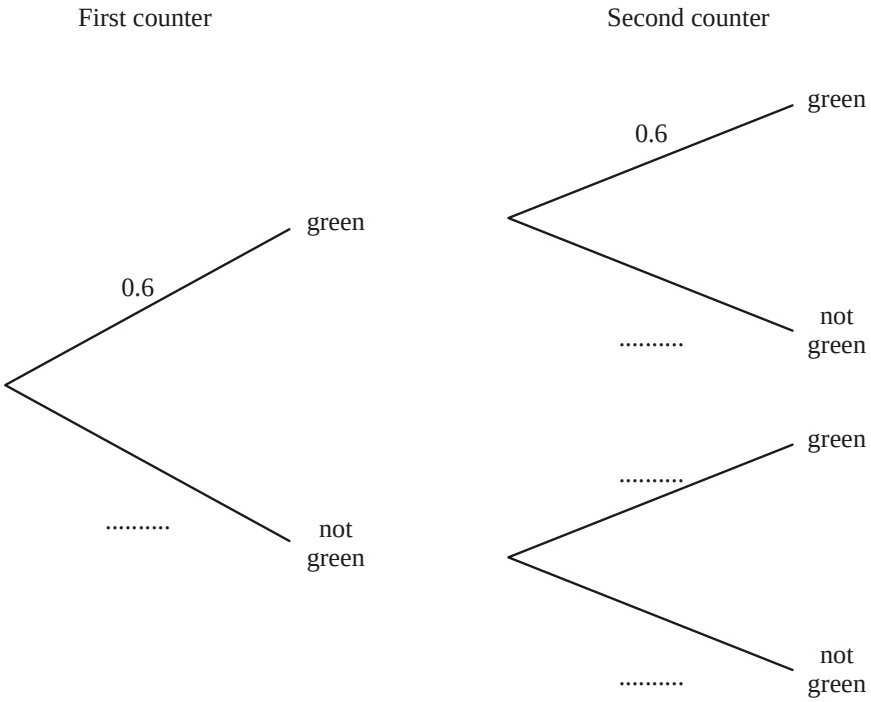
Answer .....

(c) Emma picks a counter at random.
She replaces it in the box and then picks another counter at random.

(i) Complete the tree diagram.



(ii) What is the probability that at least one of the counters is green?

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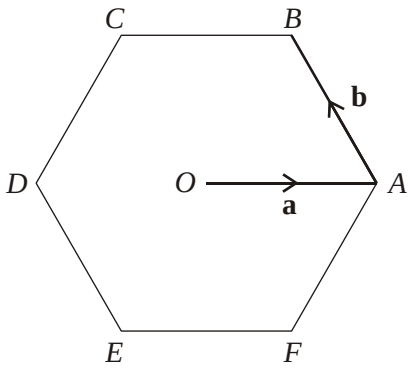
Answer .....

7. *ABCDEF* is a regular hexagon with centre *O*.

$\overrightarrow{OA}$ = **a** and $\overrightarrow{AB}$ = **b**

Diagram drawn accurately



(a) Find expressions, in terms of **a** and **b**, for

(i) $\overrightarrow{OB}$

Answer .....

(ii) $\overrightarrow{AC}$

Answer .....

(iii) $\overrightarrow{EC}$

Answer .....

(b) The positions of points *P* and *Q* are given by the vectors

$\overrightarrow{OP}$ = **a** – **b** $\overrightarrow{OQ}$ = **a** + 2**b**

(i) Draw and label the positions of points *P* and *Q* on the diagram.

(ii) Hence, or otherwise, deduce an expression for $\overrightarrow{PQ}$.

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Answer .....