Write your name here

Surname	Other Names

Mathematics
November 2017 Paper 3 (Calculator Allowed)
Part 1 (First half of the paper)
Edexcel Higher Tier

Time: 45 minutes

| Q	Topic	Max Mark	My Marks
1	Averages, Frequency Polygons	3	
2	Conversions, Exchange Rates	3	
3	Compound Measures, Density	3	
4	Ratio Problems	3	
5	Indices, Error Intervals	3	
6	Forming and Solving Equations	5	
7	Standard Form	2	
8	Experimental Probability	3	
9	Compound Interest and Depreciation, Reverse Percentage	5	
10	Probability and Relative Frequency	3	
11	Cumulative Frequency	4	
12	Probability Trees, Relative Frequency	3	
	Total	40	

1   The table shows information about the heights of 80 children.

Height (h cm)	Frequency
$130 < h \leqslant 140$	4
$140 < h \leqslant 150$	11
$150 < h \leqslant 160$	24
$160 < h \leqslant 170$	22
$170 < h \leqslant 180$	19

(a) Find the class interval that contains the median.

....

(1)

(b) Draw a frequency polygon for the information in the table.

(2)
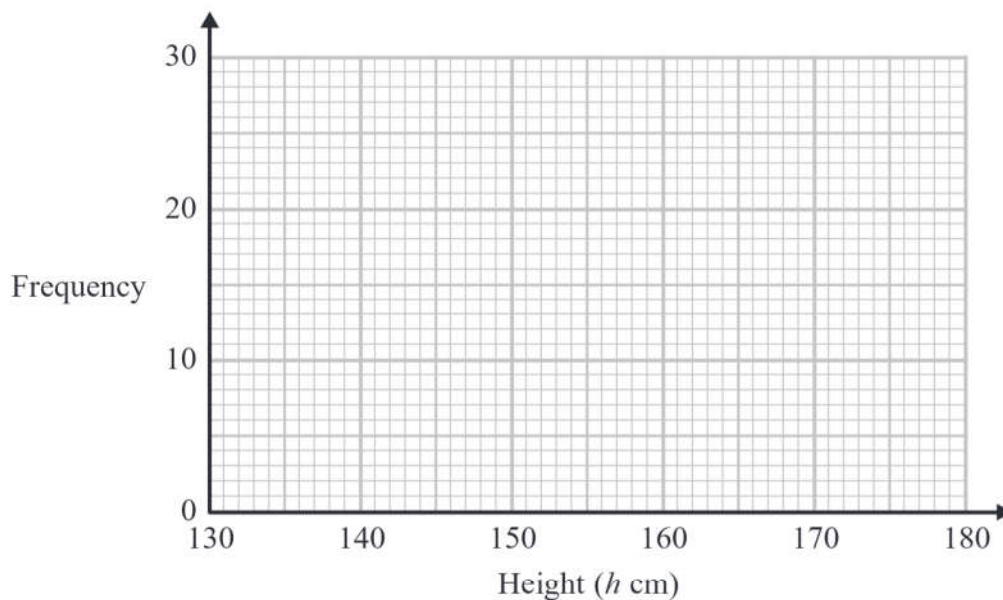
(Total for Question 1 is 3 marks)

2 In London, 1 litre of petrol costs 108.9p
In New York, 1 US gallon of petrol costs \$2.83

1 US gallon = 3.785 litres
£1 = \$1.46

In which city is petrol better value for money, London or New York?
You must show your working.

(Total for Question 2 is 3 marks)

3 A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm^3

Work out the volume of the gold bar.
Give your answer correct to 3 significant figures.

.... cm^3

(Total for Question 3 is 3 marks)

4 There are only blue pens, green pens and red pens in a box.

The ratio of the number of blue pens to the number of green pens is 2 : 5
The ratio of the number of green pens to the number of red pens is 4 : 1

There are less than 100 pens in the box.

What is the greatest possible number of red pens in the box?

....

(Total for Question 4 is 3 marks)

5 (a) Find the value of the reciprocal of 1.6
Give your answer as a decimal.

....

(1)

Jess rounds a number, x, to one decimal place.
The result is 9.8

(b) Write down the error interval for x.

....

(2)

(Total for Question 5 is 3 marks)
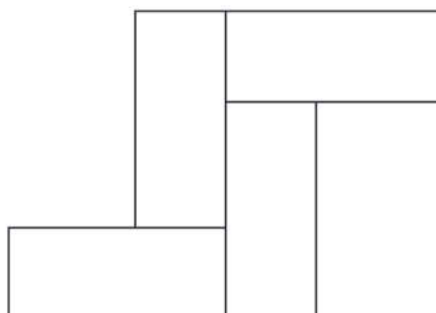
6 Here is a rectangle.

The length of the rectangle is 7 cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.

The perimeter of the 8-sided shape is 70 cm.

Work out the area of the 8-sided shape.

.... cm²

(Total for Question 6 is 5 marks)

7 Work out $(13.8 \times 10^7) \times (5.4 \times 10^{-12})$

Give your answer as an ordinary number.

....

(Total for Question 7 is 2 marks)

8 When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	Mel	Tom
point down	31	53	16
point up	14	27	9

Rachael is going to drop the drawing pin once.

(a) Whose results will give the best estimate for the probability that the drawing pin will land point up?
Give a reason for your answer.

....

....

(1)

Stuart is going to drop the drawing pin twice.

(b) Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

....

(2)

(Total for Question 8 is 3 marks)

9 Jack bought a new boat for £12500

The value, £V, of Jack's boat at the end of n years is given by the formula

$$V = 12\,500 \times (0.85)^n$$

(a) At the end of how many years was the value of Jack's boat first less than 50% of the value of the boat when it was new?

....

(2)

A savings account pays interest at a rate of $R\%$ per year.
Jack invests £5500 in the account for one year.

At the end of the year, Jack pays tax on the interest at a rate of 40%.
After paying tax, he gets £79.20

(b) Work out the value of R.

....

(3)

(Total for Question 9 is 5 marks)

10 There are only blue counters, yellow counters, green counters and red counters in a bag.
A counter is taken at random from the bag.

The table shows the probabilities of getting a blue counter or a yellow counter or a green counter.

Colour	blue	yellow	green	red
Probability	0.2	0.35	0.4	

(a) Work out the probability of getting a red counter.

....
(1)
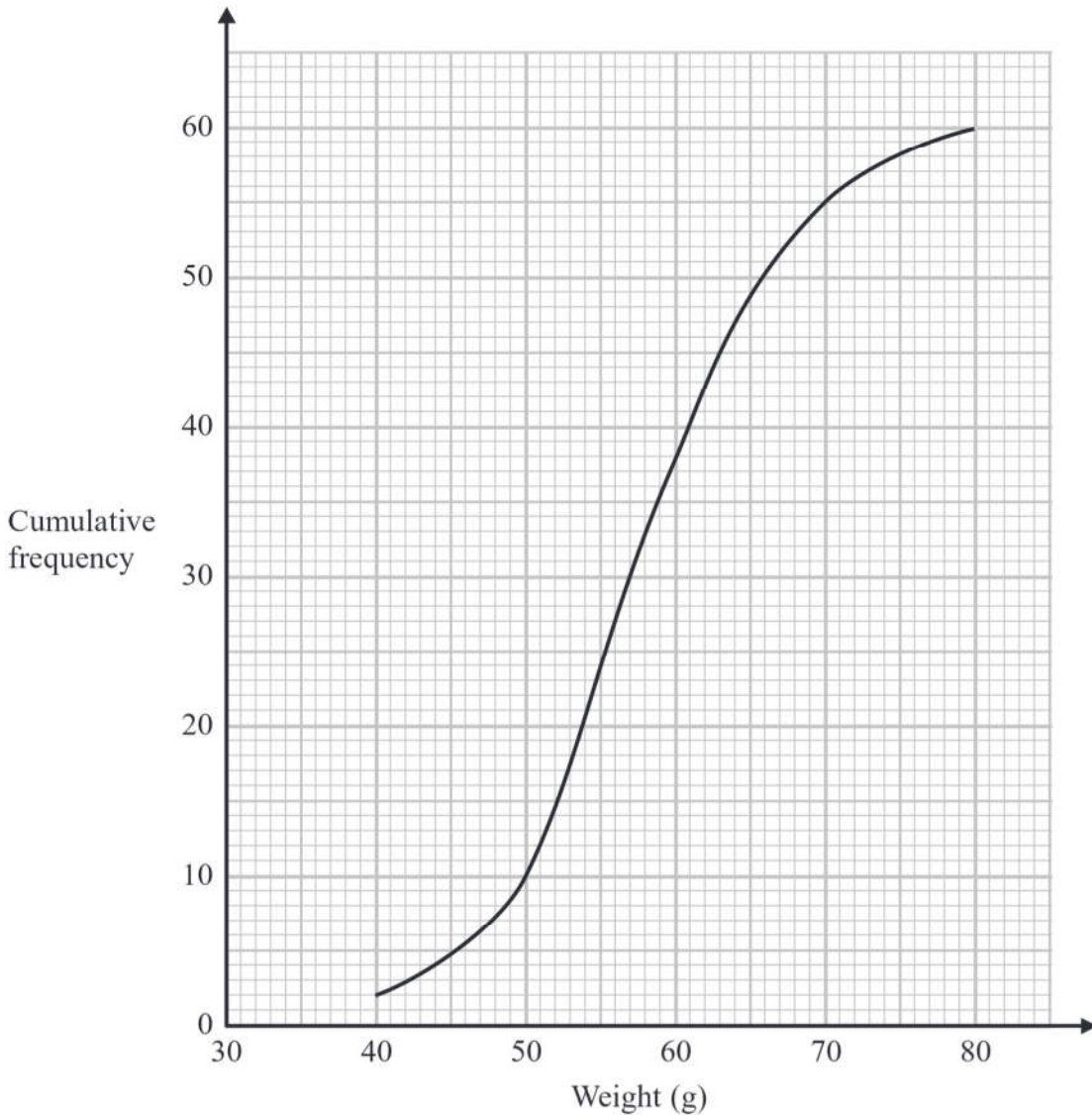
(b) What is the least possible number of counters in the bag?
You must give a reason for your answer.

....

....
(2)

(Total for Question 10 is 3 marks)

11 The cumulative frequency graph shows information about the weights of 60 potatoes.

(a) Use the graph to find an estimate for the median weight.

.... g

(1)

Jamil says,

"80 − 40 = 40 so the range of the weights is 40 g."

(b) Is Jamil correct?
You must give a reason for your answer.

....

....

(1)

(c) Show that less than 25% of the potatoes have a weight greater than 65 g.

(2)

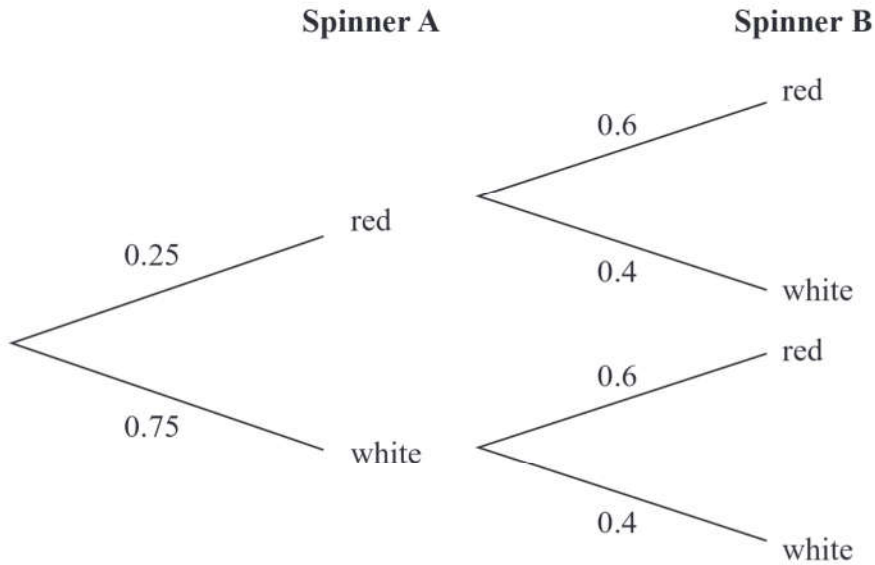**(Total for Question 11 is 4 marks)**

Turn over ▶

12 Alan has two spinners, spinner **A** and spinner **B**.
Each spinner can land on only red or white.

The probability that spinner **A** will land on red is 0.25
The probability that spinner **B** will land on red is 0.6

The probability tree diagram shows this information.

$$\text{Spinner A} \qquad\qquad \text{Spinner B}$$

```
                                              0.6      red
                                        red  <
                              0.25            0.4      white
                          <
                              0.75           0.6      red
                                        white <
                                              0.4      white
```

Alan spins spinner **A** once and he spins spinner **B** once.
He does this a number of times.

The number of times **both** spinners land on red is 24

Work out an estimate for the number of times **both** spinners land on white.

....

(Total for Question 12 is 3 marks)