

Write your name here

Surname

Other Names

Mathematics

June 2018 Paper 3 (Calculator Allowed)
Part 1 (First half of the paper)
Edexcel Higher Tier

Time: 45 minutes

Q	Topic	Max Mark	My Marks
1	Scatter Graphs	3	
2	Expanding and Simplifying	2	
3	Area of a Trapezium, Triangle	2	
4	Probability Trees	2	
5	Trigonometry (SOHCAHTOA)	3	
6	Probability and Relative Frequency	5	
7	Solving Equations	3	
8	Angles in Polygons	5	
9	Standard Form, Substitution	4	
10	Prime Factors, HCF and LCM	3	
11	Repeated Percentage Change	3	
12	Real Life Graphs, Gradient	4	
	Total	39	

For worked solutions and video solutions visit mathsgenie.co.uk

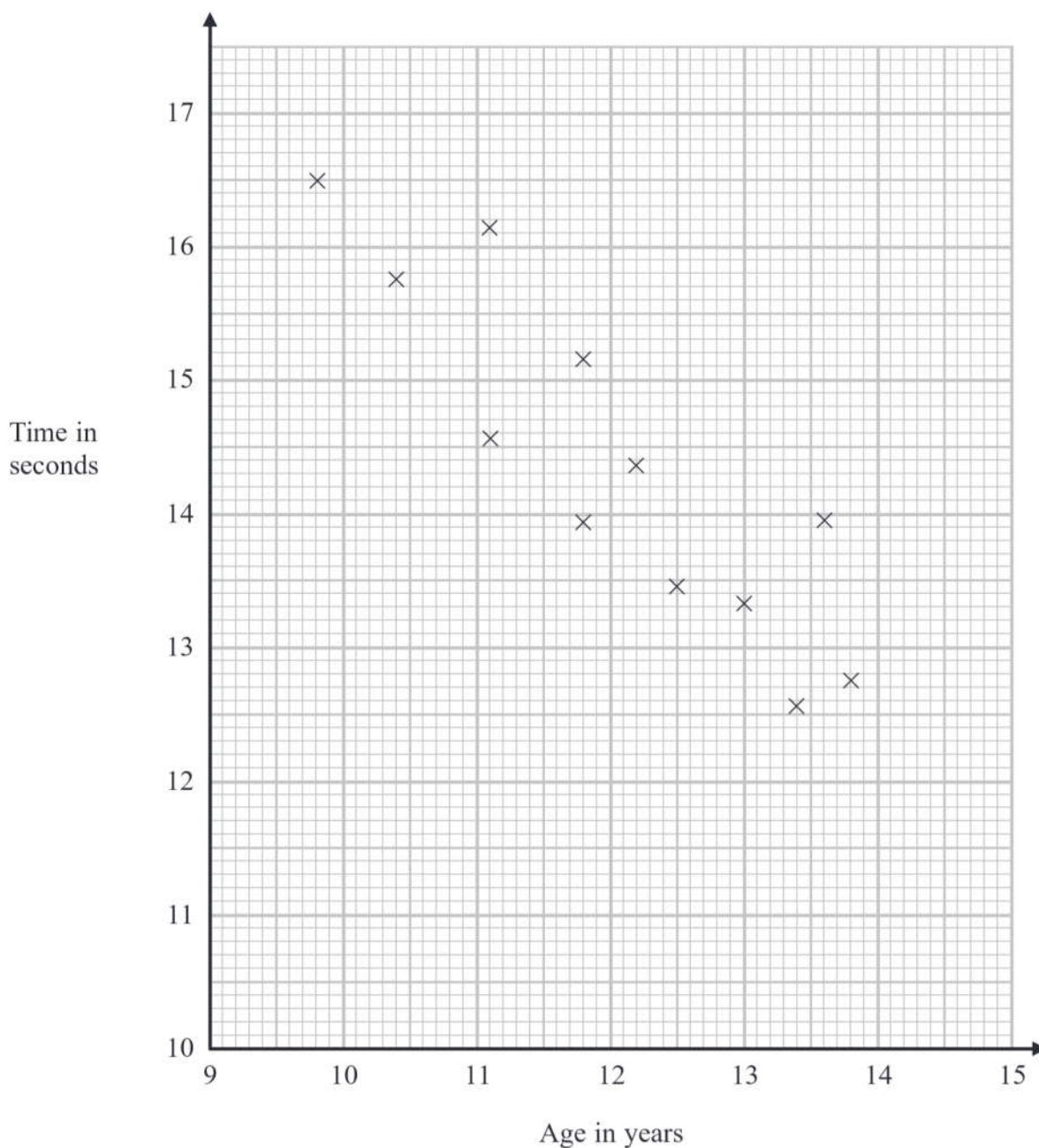
Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The scatter diagram shows information about 12 girls.

It shows the age of each girl and the best time she takes to run 100 metres.



(a) Write down the type of correlation.

(1)

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Kristina is 11 years old.
Her best time to run 100 metres is 12 seconds.

The point representing this information would be an outlier on the scatter diagram.

(b) Explain why.

(1)

Debbie is 15 years old.

Debbie says,

“The scatter diagram shows I should take less than 12 seconds to run 100 metres.”

(c) Comment on what Debbie says.

(1)

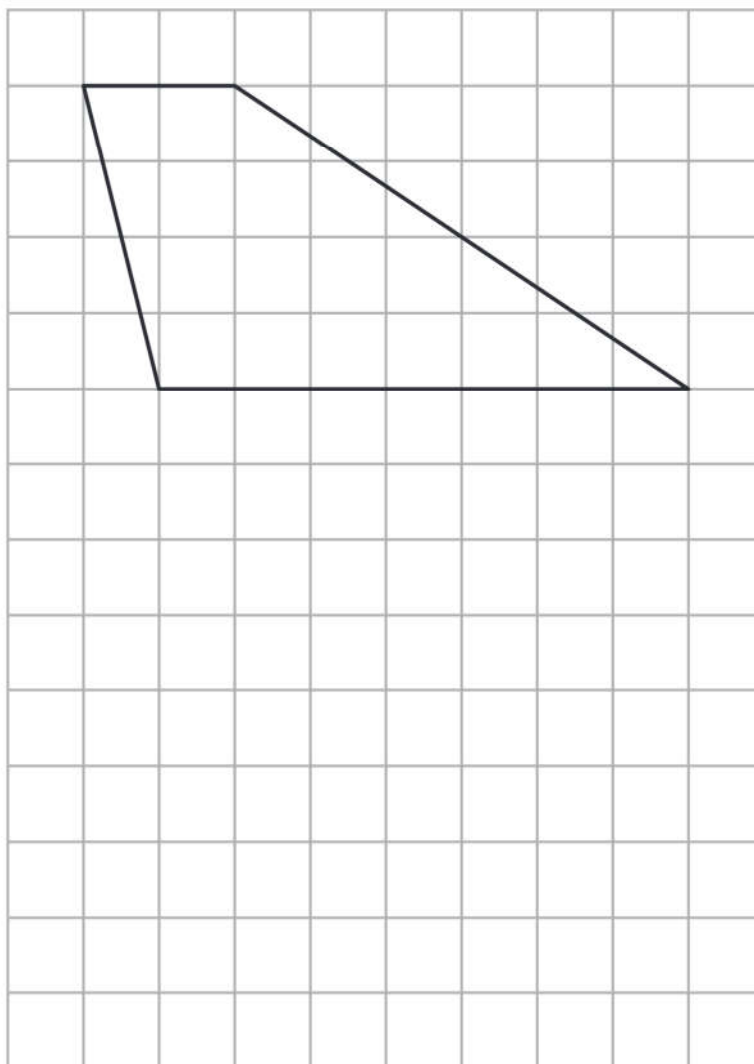
(Total for Question 1 is 3 marks)

2 Expand and simplify $5(p + 3) - 2(1 - 2p)$

(Total for Question 2 is 2 marks)



3 Here is a trapezium drawn on a centimetre grid.



On the grid, draw a triangle equal in area to this trapezium.

(Total for Question 3 is 2 marks)

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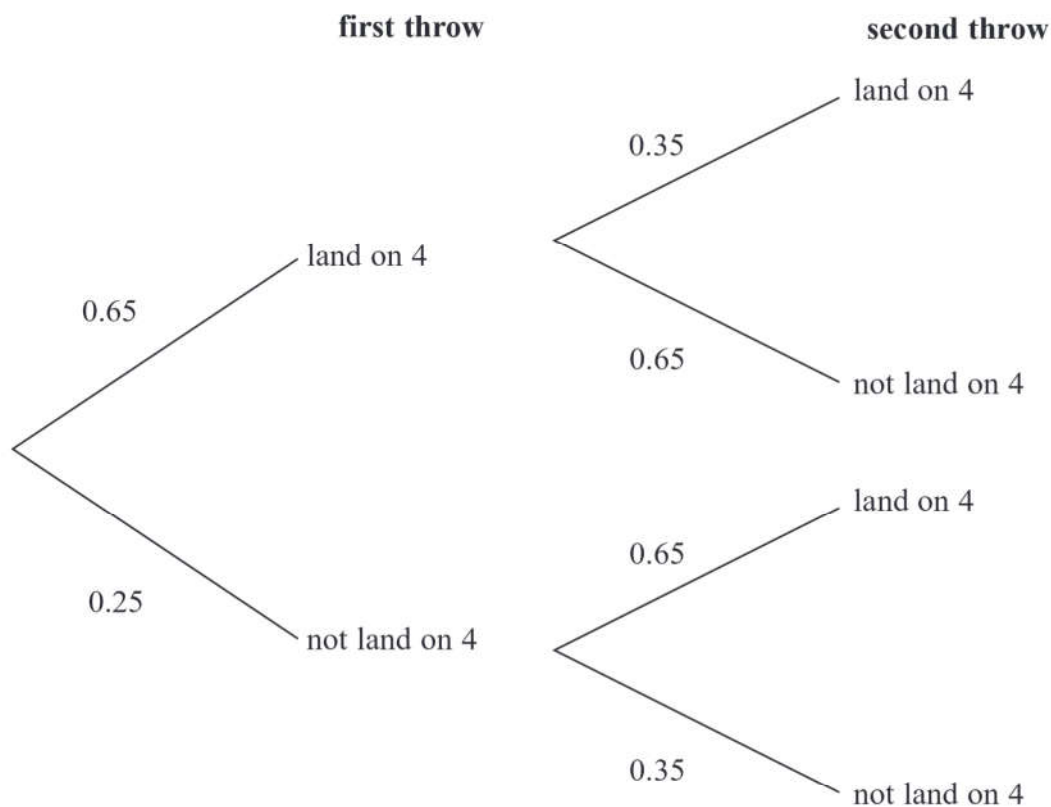
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4 When a biased 6-sided dice is thrown once, the probability that it will land on 4 is 0.65
The biased dice is thrown twice.

Amir draws this probability tree diagram.
The diagram is **not** correct.



Write down **two** things that are wrong with the probability tree diagram.

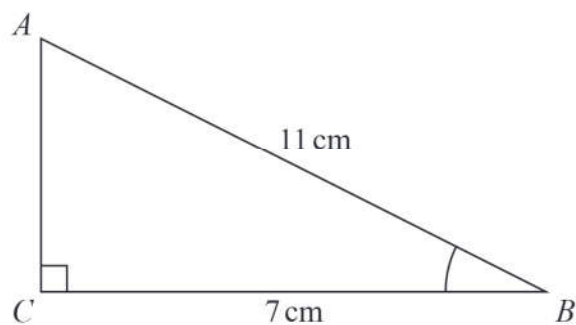
1.....
.....

2.....
.....

(Total for Question 4 is 2 marks)



5 ABC is a right-angled triangle.



- (a) Work out the size of angle ABC .
Give your answer correct to 1 decimal place.

.....
(2)

The length of the side AB is reduced by 1 cm .

The length of the side BC is still 7 cm .
Angle ACB is still 90°

- (b) Will the value of $\cos ABC$ increase or decrease?
You must give a reason for your answer.

.....
.....
(1)

(Total for Question 5 is 3 marks)



6 There are some counters in a bag.
The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

Colour	red	white	blue	yellow
Probability			0.45	0.25

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the counter will be white.

(a) Work out the number of red counters in the bag.

.....
(4)

A marble is going to be taken at random from a box of marbles.
The probability that the marble will be silver is 0.5

There must be an even number of marbles in the box.

(b) Explain why.

.....
.....
(1)

(Total for Question 6 is 5 marks)



7 Solve $\frac{5-x}{2} = 2x-7$

$x = \dots\dots\dots$

(Total for Question 7 is 3 marks)

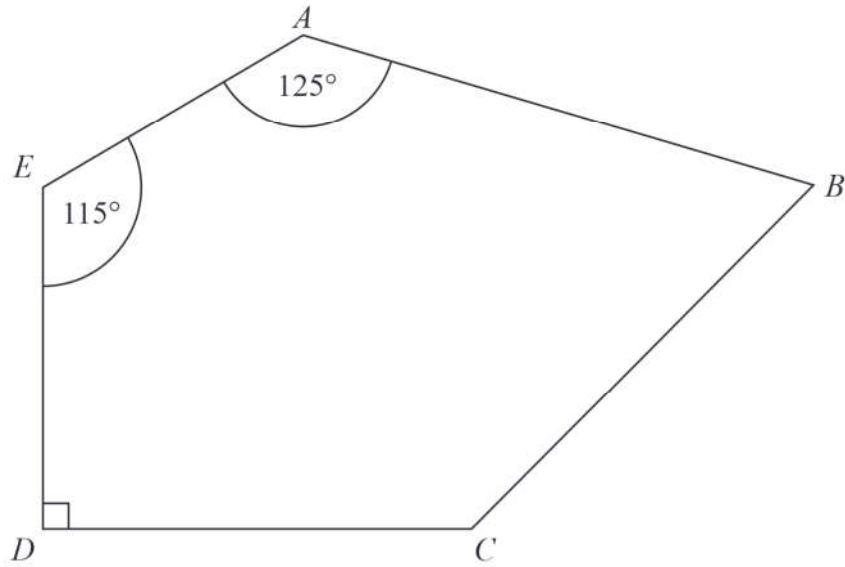
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8 $ABCDE$ is a pentagon.



Angle $BCD = 2 \times$ angle ABC

Work out the size of angle BCD .
You must show all your working.

(Total for Question 8 is 5 marks)



9 $T = \sqrt{\frac{w}{d^3}}$

$$w = 5.6 \times 10^{-5}$$

$$d = 1.4 \times 10^{-4}$$

(a) Work out the value of T .

Give your answer in standard form correct to 3 significant figures.

$$T = \dots\dots\dots (2)$$

w is increased by 10%

d is increased by 5%

Lottie says,

“The value of T will increase because both w and d are increased.”

(b) Lottie is wrong.

Explain why.

.....
.....
(2)

(Total for Question 9 is 4 marks)



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10 Here are three lamps.

lamp A



lamp B



lamp C



- Lamp A flashes every 20 seconds.
- Lamp B flashes every 45 seconds.
- Lamp C flashes every 120 seconds.

The three lamps start flashing at the same time.

How many times in one hour will the three lamps flash at the same time?

(Total for Question 10 is 3 marks)



11 In 2003, Jerry bought a house.

In 2007, Jerry sold the house to Mia.
He made a profit of 20%

In 2012, Mia sold the house for £162 000
She made a loss of 10%

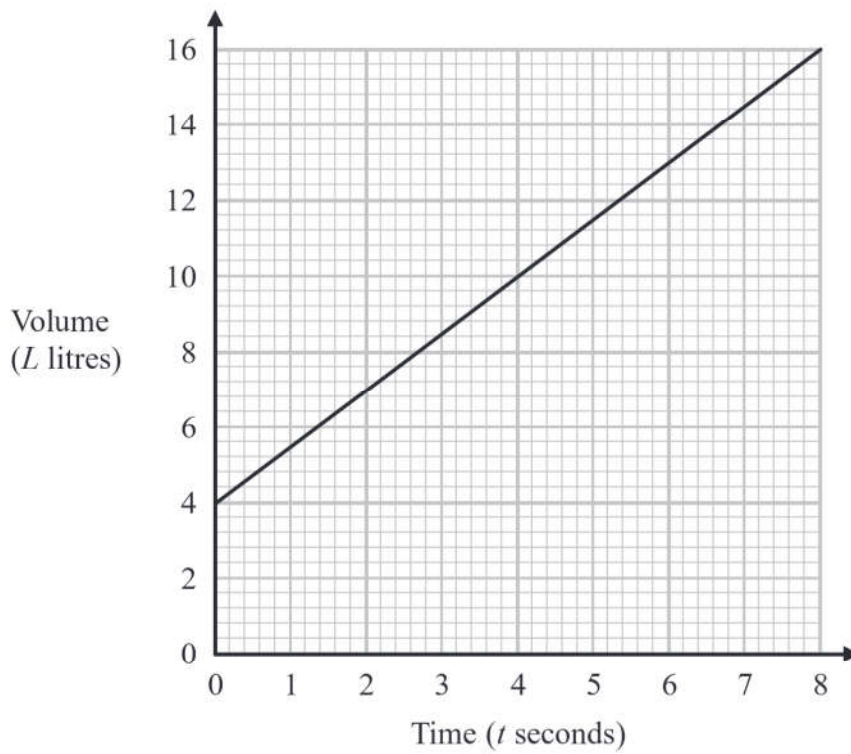
Work out how much Jerry paid for the house in 2003

£.....

(Total for Question 11 is 3 marks)



12 The graph shows the volume of liquid (L litres) in a container at time t seconds.



(a) Find the gradient of the graph.

.....
(2)

(b) Explain what this gradient represents.

.....
.....
(1)

The graph intersects the volume axis at $L = 4$

(c) Explain what this intercept represents.

.....
.....
(1)

(Total for Question 12 is 4 marks)

