NON-CALC G

GCSE Mathematics · Higher Tier

40 marks · 45 minutes · Non-calculator

Name ..... **Class** .....

Answer all questions. Show all your working. Diagrams are NOT accurately drawn unless stated.

1 **(a)** Jo says,

"4.5×10^{-3} *is greater than* 3×10^{-2} *because 4.5 is greater than 3"*

Explain why Jo is wrong.

.....

(1)

(b) Work out $(4.2 \times 10^{5}) \times (3 \times 10^{-2})$

Give your answer in standard form.

.....

(2)

(Total for Question 1 is 3 marks)

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2 A shop sells cereal in two sizes of box.

Small box	Large box
250 g	400 g
£1.80	£2.72

Which box is the better value for money? You must show how you get your answer.

(Total for Question 2 is 3 marks)

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3 80 customers in a café each choose one drink: tea, coffee or hot chocolate.
30 of the customers are children. 18 of the adults choose tea.
4 of the children choose coffee. 8 of the adults choose hot chocolate.
32 of the customers choose hot chocolate.

(a) Use this information to complete the two-way table.

	Tea	Coffee	Hot chocolate	Total
Adults				
Children				
Total				

(2)

(b) One of the customers who chose hot chocolate is picked at random.
Work out the probability that this customer is a child.

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(1)

(Total for Question 3 is 3 marks)

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4 Work out the value of $3a^2 - 2ab$ when $a = -4$ and $b = 5$

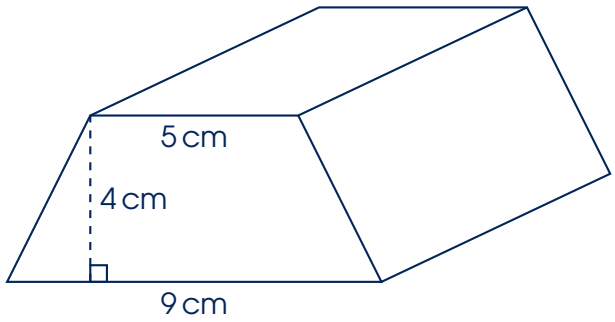
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(Total for Question 4 is 2 marks)

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5 A box of chocolates is in the shape of a prism.

The cross-section of the prism is a trapezium.



The volume of the box is 420 cm^3.

Work out the length of the box.

..... cm

(Total for Question 5 is 3 marks)

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6 Here are the first four terms of an arithmetic sequence.

3	8	13	18

(a) Find an expression, in terms of n, for the nth term of the sequence.

.....

(2)

(b) A different sequence has nth term $43 - 3n$

Show that there is no value of n for which the two sequences have the same nth term.

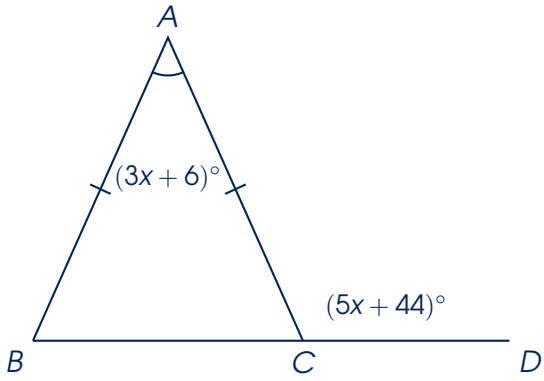
(2)

(Total for Question 6 is 4 marks)

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7 ABC is an isosceles triangle with $AB = AC$.

BCD is a straight line.



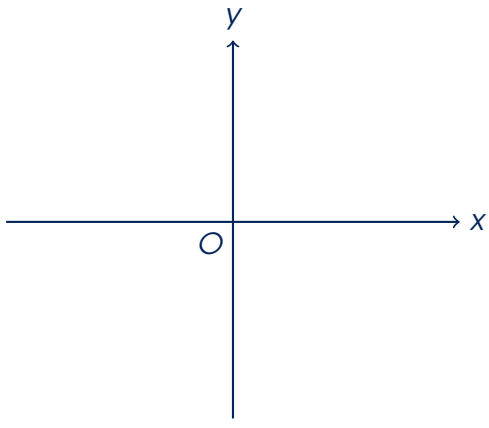
Work out the size of angle ABC.

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(Total for Question 7 is 3 marks)

8 Sketch the graph of $y = x^2 - 2x - 8$

Show the coordinates of any points where the graph crosses the axes and the coordinates of the turning point.

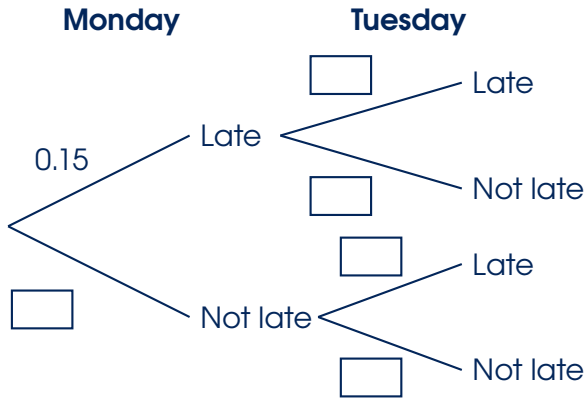


(Total for Question 8 is 3 marks)

9 The probability that Zara's bus is late on any day is 0.15

Zara catches the bus on Monday and on Tuesday.

(a) Complete the probability tree diagram.



(1)

(b) Zara says,

"The probability that my bus is late on at least one of the two days is $0.15+0.15=0.3$*"*

Is Zara correct? You must show how you get your answer.

(2)

(Total for Question 9 is 3 marks)

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10 The number of bacteria in a dish doubles every 20 minutes.

At 12 noon there are 1500 bacteria in the dish.

At what time will there first be more than 40 000 bacteria in the dish?

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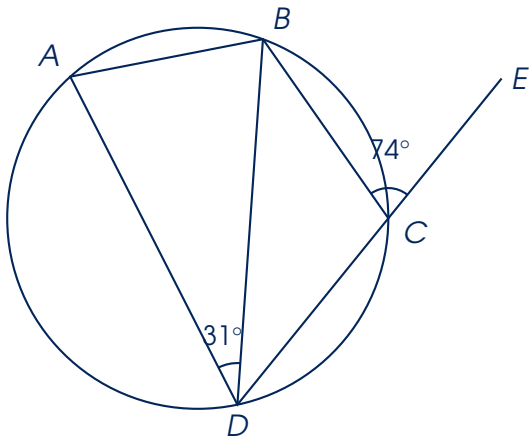
(Total for Question 10 is 3 marks)

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11 A, B, C and D are points on a circle.

DCE is a straight line.

Angle $BCE = 74°$ and angle $ADB = 31°$



Work out the size of angle ABD.

Give a reason for each stage of your working.

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(Total for Question 11 is 3 marks)

12 Solve $\frac{4}{x+4} + \frac{3}{x-1} = 1$

.....

(Total for Question 12 is 4 marks)

13 Solve $4^x \div 2^{1-x} = 8\sqrt{2}$

$x =$ .....

(Total for Question 13 is 3 marks)

TOTAL FOR PAPER IS 40 MARKS