



GCSEBITESIZE Examinations

General Certificate of Secondary Education

Specimen Paper

**MATHEMATICS
INTERMEDIATE TIER**

Paper 2 Calculator

Time allowed: 2 hours

The maximum mark for this paper is 100.

Mark allocations are shown in brackets.

Show clearly how you work out your answer.

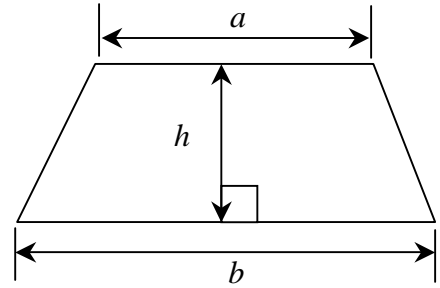
In addition to this paper you will require:

- a calculator
- mathematical instruments

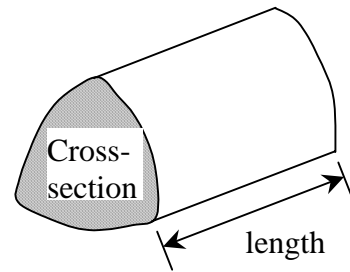
Formulae Sheet: Intermediate Tier

You may use the following formulae:

$$\text{Area of trapezium} = \frac{1}{2}(a + b)h$$



$$\text{Volume of prism} = \text{area of cross-section} \times \text{height}$$



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

1. (a) Write the following in order of size, smallest first.

0.65, $\frac{2}{3}$, 7%, $\frac{6}{7}$, 68%

.....

Answer: (2 marks)

- (b) What is $\frac{2}{7}$ of £3.56, to the nearest penny.

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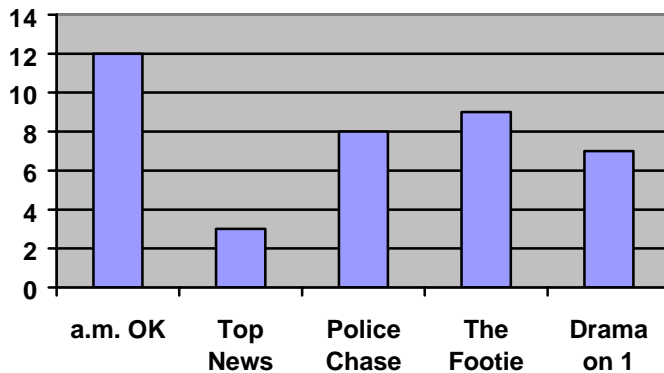
Answer: (2 marks)

- (c) A mini-disc player is priced at £75. It is put in the sale at 15% off. What is the new price?

.....

Answer: (2 marks)

2. A survey was done asking people to name their favourite TV programme. The results are shown in the chart.



- (a) How many more people said “Police Chase” than said “Top News”?

Answer: (1 mark)

- (b) How many people were asked altogether?

.....

Answer: (2 marks)

- (c) If one of these people were chosen at random, what is the probability that they had said “Drama on 1”?

Answer: (2 marks)

3. This is an exchange rate card from a travel agent's office.

	GBP (£) 1 =
USD (\$)	1.82
Euro (€)	1.43

(a) A business woman is travelling to New York. She changes £750 into US dollars (\$). How much does she get?

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Answer: (2 marks)

(b) A French company is buying goods in the UK. They change 1000 Euros (€) into GB pounds (£). How much will they get (to the nearest pound)?

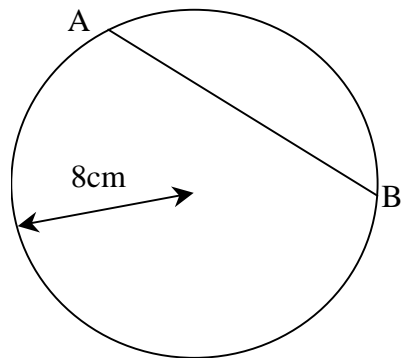
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Answer: (2 marks)

4. The circle shown has radius 8cm.

(a) What name is given to the line AB?

Answer: (1 mark)



(b) Calculate the area of the circle. Give your answer to 1 decimal place.

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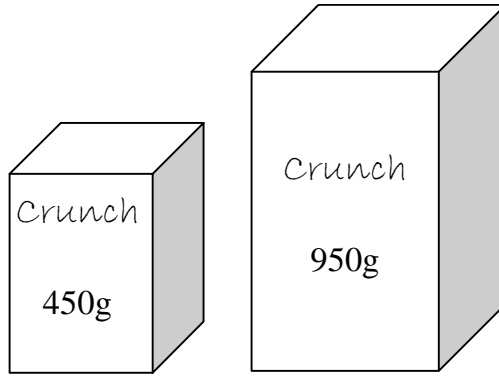
Answer: (3 marks)

(c) The circle is a picture of a wooden wheel. If it was rolled three times round along a floor. How far would it travel?

.....

Answer: (3 marks)

5. Crunch cereal is available in two different sizes.



Now
85p

Only
£1.20

(a) Work out the cost of 100g of Crunch when bought in the 450g box. (to the nearest whole pence)

.....
.....

Answer: (2 marks)

(b) Work out the cost of 450g of Crunch when bought in the 950g box (to the nearest whole pence).

.....
.....
.....

Answer: (2 marks)

(c) Which is the better buy? Give one reason in support of each size.

.....
.....
.....

Answer: (2 marks)

6. This is a list of the ages of customers who shopped in a newsagent's one day:

4, 7, 23, 14, 8, 7, 40, 81, 45, 1

(a) Find the median of the ages.

.....
.....
Answer: (2 marks)

(b) Work out the mean of the ages.

.....
.....
Answer: (2 marks)

(c) Explain why the mode is not a good measure of average for this data.

.....
.....
Answer: (1 mark)

(d) Which is the best measure – median or mean? Justify your answer.

.....
.....
Answer: (2 marks)

7. A class contains 13 boys and 17 girls. A student is chosen at random.

(a) What is the probability that a girl is chosen?

Answer: (1 mark)

7 of the students have blue eyes, 5 have green eyes and the rest have brown eyes.

(b) What is the probability that a student with brown eyes is chosen?
(Simplify your answer)

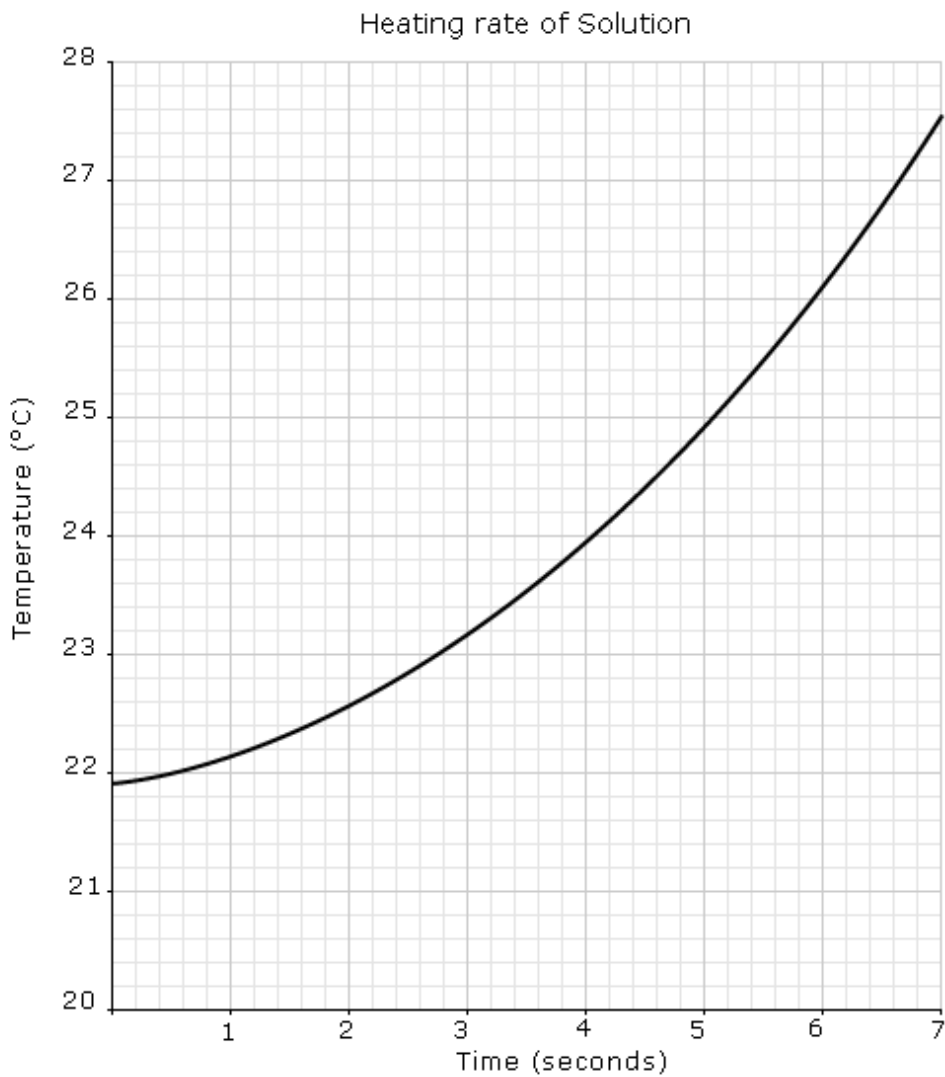
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Answer: (2 marks)

No boys have green eyes and half of the brown eyed students are boys.

(c) What is the probability that the chosen student is a girl with blue eyes?

.....
.....
Answer: (2 marks)

8. The graph shows the temperature of a solution in an experiment.



(a) Reading from the graph, what is the temperature after 4 seconds?

Answer: (1 mark)

(b) Reading from the graph, how long did it take for the temperature to reach 27°?

Answer: (1 mark)

(c) What was the total rise in temperature in the first 7 seconds?

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.....
.....

Answer: (2 marks)

(d) If the experiment carried on, estimate the temperature after 8 seconds.

Answer: (2 marks)

9. Given that $a = 3$, $b = 7$ and $c = -2$:

(a) What is the value of $2a + b$?

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 Answer: (1 mark)

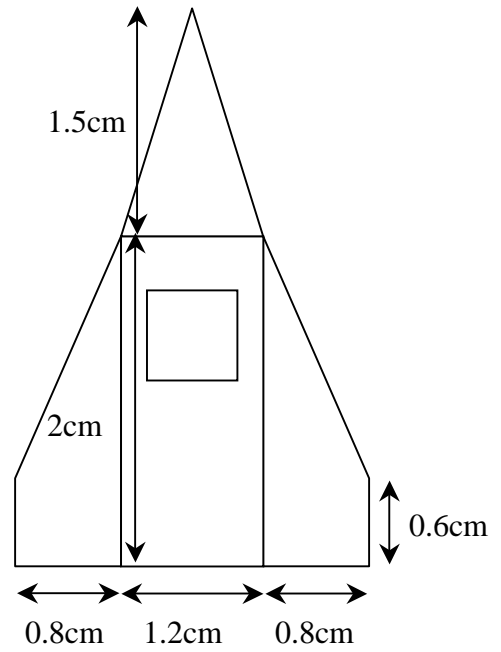
(b) What is the value of $2c^2$?

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 Answer: (1 mark)

(c) Solve the equation $ax + b = 22$

.....
 Answer: (2 marks)

10. A rocket design is made from gold leaf. The square window has side length of 0.9cm. It is cut out and removed. Calculate the total area of the design. Show your calculations for each part separately.



Square

Rectangle.....

Triangle.....

Trapezium.....

Whole design.....

 (6 marks)

11. Calculate the value of: $\frac{3.46^3 + \sqrt{2.3^2 + 1}}{2.7} + 3.6$

Give your answer correct to 3 significant figures.

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 (3 marks)

12. (a) Write 156,700,000 in standard form.

Answer: (1 mark)

(b) Write 9.02×10^{-3} as an ordinary number.

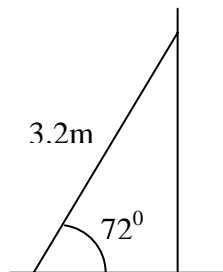
Answer: (1 mark)

(c) Calculate the value of $\frac{2.67 \times 10^5}{3.92 \times 10^{-3}}$, giving your answer in standard form.

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 Answer: (2 marks)

13. A ladder 3.2 metres long is propped up on a horizontal surface against a vertical wall. The angle that the ladder makes with the ground is 72° .

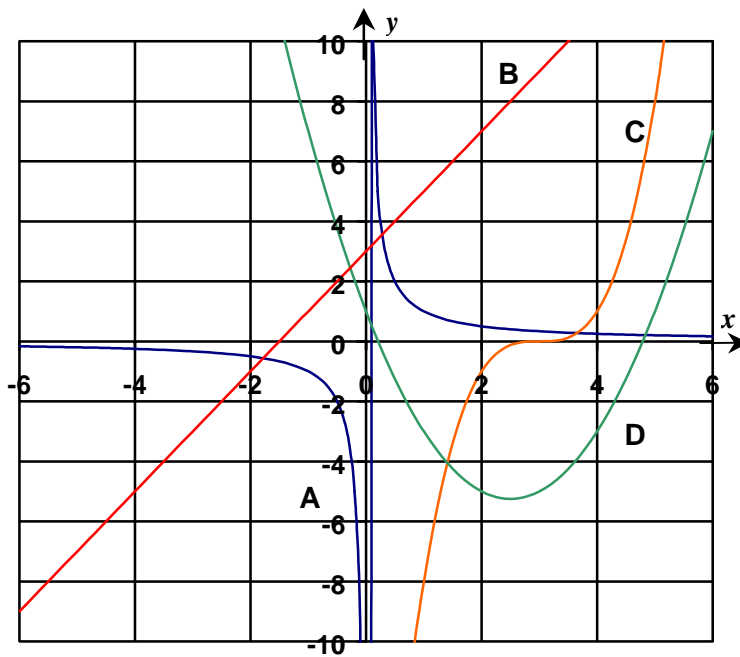


Calculate the height of the top of the ladder against the wall.

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 Answer: (3 marks)

14. Write the letter for the graph corresponding to each function in the table.



Function	Graph
$y = 2x + 3$	
$y = \frac{1}{x}$	
$y = (x - 3)^3$	
$y = x^2 - 5x + 1$	

(3 marks)

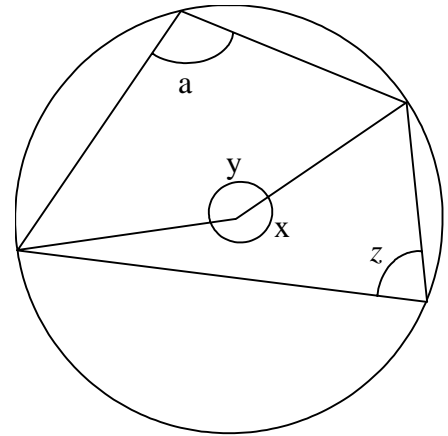
15. Express the angle x in terms of a .

Answer.....
(1 mark)

Hence or otherwise, prove that the opposite angles in a cyclic quadrilateral add up to 180° .

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 (3 marks)

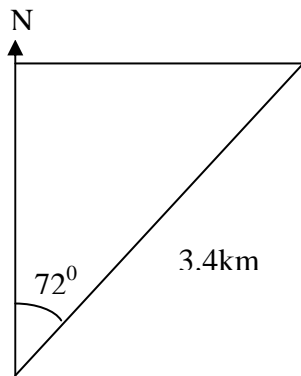


16. Rearrange the following, making c the subject: $\frac{3c + b}{2} = c + a$

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 (3 marks)

17. A ship sets off on a bearing 072° from port and travels 3.4km in a straight line. How far North of the ship's starting position is its final position to 2 decimal places?



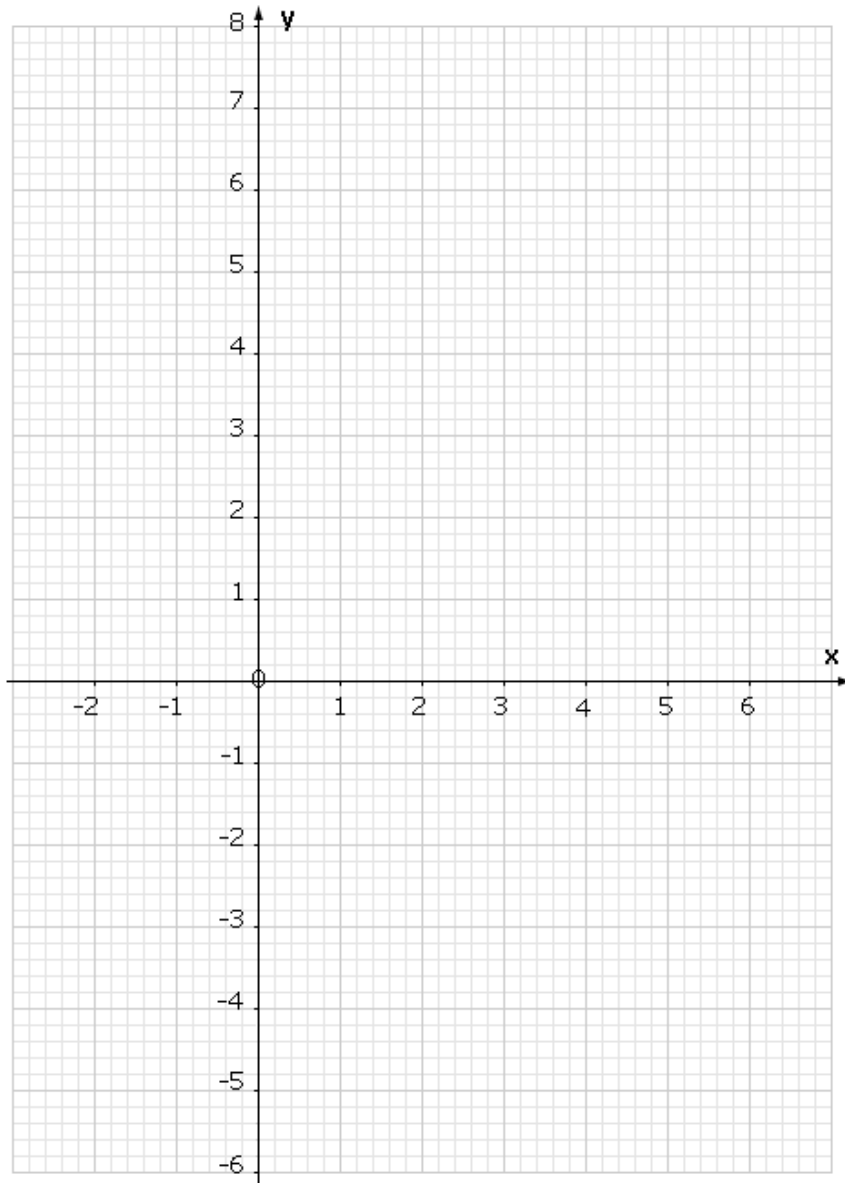
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Answer: (3 marks)

20. (a) Fill in the following table for the function: $y = x^2 - 3x - 3$ (2 marks)

x	-2	-1	0	1	2	3	4	5
y								

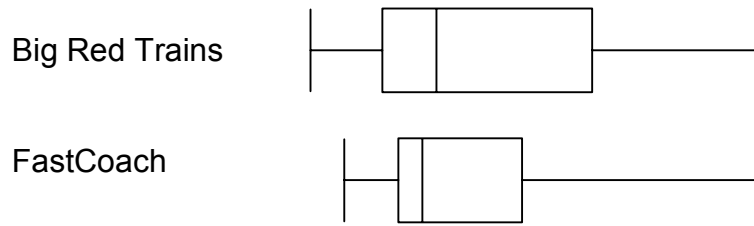
- (b) Plot the graph (2 marks)



- (c) Find approximate solutions to: $x^2 - 3x - 3 = 0$
 (2 marks)
- (d) Find approximate solutions to: $x^2 - 3x - 3 = 3$
 (2 marks)

21. The two box plots give data about the journey time from Birmingham to Manchester of trains run by two different companies. Give a reason, supported by the two different statistics, to suggest why one of the companies is better.

Journey time from London to Manchester



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(4 marks)