NON-CALC E

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 Ava writes down a number, y.

She truncates y to 1 decimal place. The result is 6.4

Write down the error interval for y.

.....

(Total for Question 1 is 2 marks)

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2 The value of a painting changed over three years.

In year 1, its value increased by 20%.

In year 2, its value increased by 10%.

In year 3, its value decreased by 25%.

Leo says,

"$20 + 10 - 25 = 5$, *so the painting is now worth 5% more than at the start.*"

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

(Total for Question 2 is 3 marks)

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3 The table shows information about the number of books read last month by each of 20 students.

Number of books	Frequency
0	3
1	7
2	6
3	3
4	1

(a) Find the median number of books.

.....

(1)

(b) Work out the mean number of books.

.....

(2)

(Total for Question 3 is 3 marks)

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4 Factorise $3x^2 + 10x - 8$

.....

(Total for Question 4 is 2 marks)

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5 ABC is an isosceles triangle.

$AB = AC = 9\,\text{cm}$ $BC = 6\,\text{cm}$

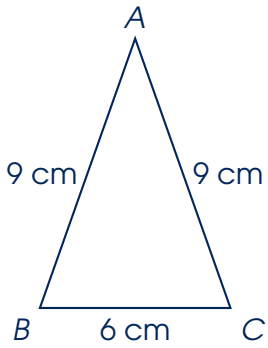


Diagram NOT accurately drawn

Work out the area of triangle ABC.

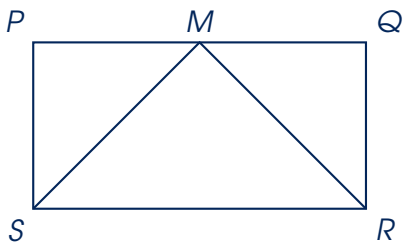
Give your answer in the form $a\sqrt{b}$, where a and b are integers and b is prime.

..... cm^2

(Total for Question 5 is 3 marks)

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6 $PQRS$ is a rectangle. M is the midpoint of PQ.



Prove that triangle MPS is congruent to triangle MQR.

(Total for Question 6 is 3 marks)

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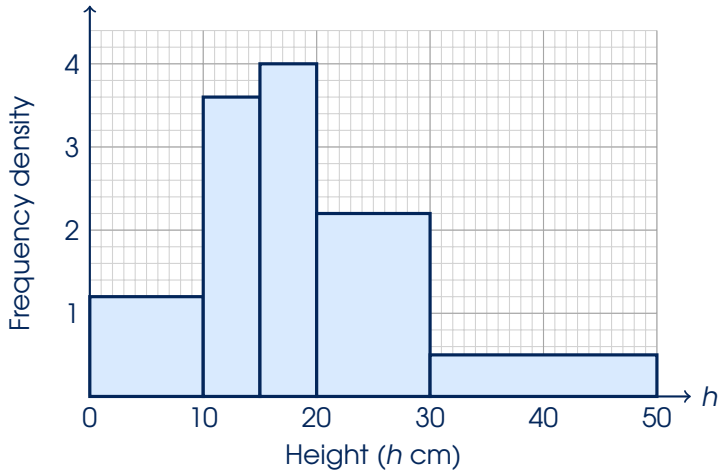
7 Solve the simultaneous equations

$$y = x^2 - 4x + 5$$
$$y = 2x - 3$$

.....

(Total for Question 7 is 4 marks)

8 The histogram shows information about the heights, h cm, of some plants.



(a) Work out the number of plants with a height between 10 cm and 15 cm.

.....

(1)

(b) Work out an estimate for the number of plants with a height greater than 25 cm.

.....

(2)

(c) Mo says,

"*The median height is in the class* $20 < h \leqslant 30$"

Is Mo correct? You must give a reason for your answer.

.....

.....

(1)

(Total for Question 8 is 4 marks)

9 **(a)** Expand and simplify $(4-\sqrt{3})(2+\sqrt{3})$

Give your answer in the form $a+b\sqrt{3}$, where a and b are integers.

.....

(2)

(b) Show that $\left(\sqrt{12}+\sqrt{3}\right)^2 = 27$

(2)

(Total for Question 9 is 4 marks)

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10 The line **L** has equation $3x - 2y = 8$

The line **M** is parallel to **L** and passes through the point $(2,\ 9)$

M crosses the x-axis at the point P.

Find the coordinates of P.

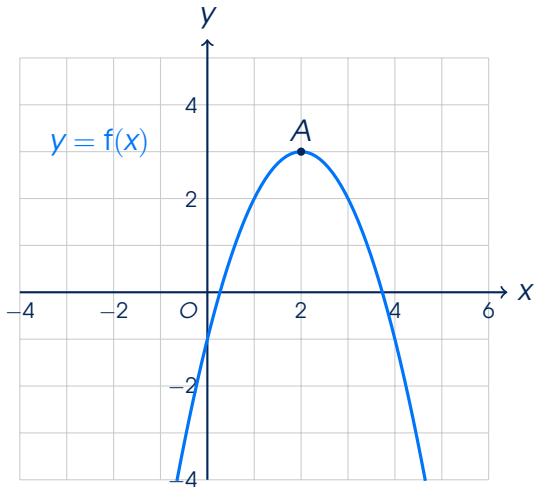
(.....)

(Total for Question 10 is 3 marks)

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11 The graph of $y = f(x)$ is shown on the grid.

The graph has a maximum point at $A(2, 3)$.



(a) Write down the coordinates of the maximum point of the graph of $y = f(x + 3)$

(.....)

(1)

(b) Write down the coordinates of the turning point of the graph of $y = -f(x)$

(.....)

(1)

(Total for Question 11 is 2 marks)

12 *ADB* and *AEC* are straight lines. *DE* is parallel to *BC*.

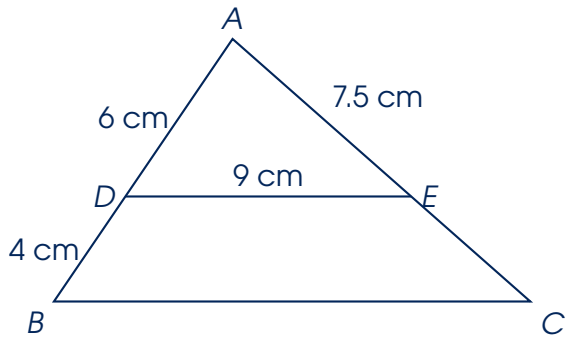


Diagram NOT accurately drawn

Work out the perimeter of the trapezium *DBCE*.

..... cm

(Total for Question 12 is 4 marks)

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13 Prove that the sum of the squares of any three consecutive integers is always 1 less than a multiple of 3

(Total for Question 13 is 3 marks)

TOTAL FOR PAPER IS 40 MARKS