NON-CALC J

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 The time, t seconds, that Maya takes to run 100 metres is 12.7 seconds, correct to 1 decimal place.

Write down the error interval for t.

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(Total for Question 1 is 2 marks)

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2 A football club increases the prices of all its season tickets by 12%.

After the increase, an adult season ticket costs £336

Before the increase, a junior season ticket cost £150

Sam buys one adult season ticket and one junior season ticket at the new prices.

Work out how much more Sam pays altogether, compared with the old prices.

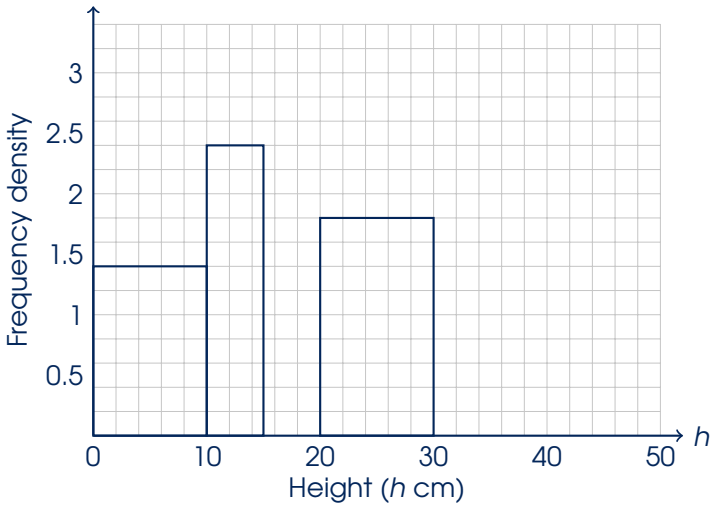
£ .....

(Total for Question 2 is 4 marks)

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3 The table and the histogram give information about the heights, h cm, of some plants.

Height (h cm)	Frequency
$0 < h \leqslant 10$	
$10 < h \leqslant 15$	12
$15 < h \leqslant 20$	15
$20 < h \leqslant 30$	
$30 < h \leqslant 50$	8



(a) Use the histogram to complete the table.

(1)

(b) Use the table to complete the histogram.

(2)

(Total for Question 3 is 3 marks)

4 Solve $2x^2 + 5x - 12 = 0$

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(Total for Question 4 is 3 marks)

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5 The extension, E mm, of a spring is directly proportional to the mass, M grams, hanging on the spring.

When $M = 80$, $E = 12$

(a) Find a formula for E in terms of M.

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(2)

(b) Work out the mass hanging on the spring when the extension is 27 mm.

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(1)

(Total for Question 5 is 3 marks)

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6 Priya makes three-digit numbers using the digits 1, 2, 3, 4, 5, 6, 7, 8 and 9

Each digit can be used only once in a number.

The number must be even and greater than 500

How many different numbers can Priya make?

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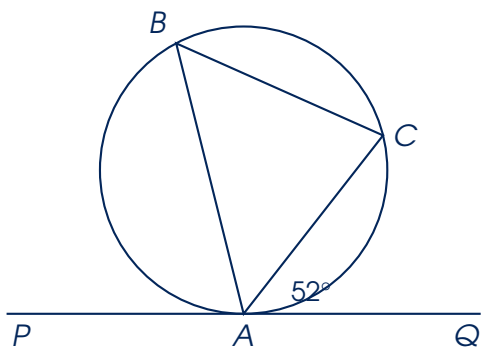
(Total for Question 6 is 2 marks)

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7 A, B and C are points on a circle.

PAQ is the tangent to the circle at A.

$AC = BC$ Angle $QAC = 52°$



Work out the size of angle PAB.

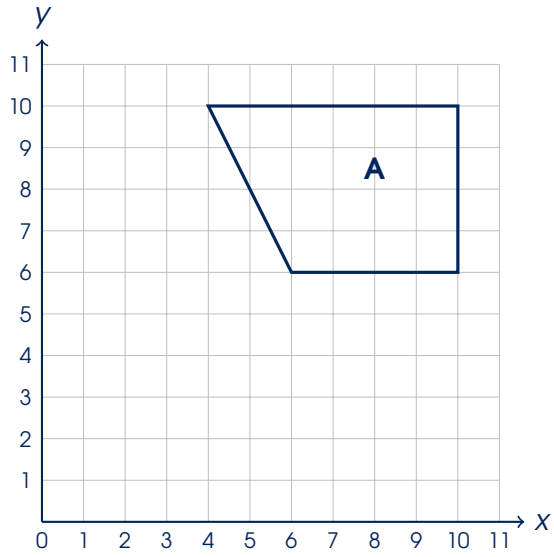
Give a reason for each stage of your working.

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(Total for Question 7 is 3 marks)

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8 Shape **A** is drawn on the grid.



Enlarge shape **A** by scale factor $\frac{1}{2}$, centre $(2, 0)$.

(Total for Question 8 is 2 marks)

9 The function f is such that $f(x) = \dfrac{2x+3}{5}$

(a) Find $f^{-1}(x)$

$f^{-1}(x) =$ .....

(2)

(b) Solve $f(x) = f^{-1}(x)$

$x =$ .....

(2)

(Total for Question 9 is 4 marks)

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10 Show that $\dfrac{18}{\sqrt{6}} - \sqrt{24}$ can be written as $\sqrt{6}$

(Total for Question 10 is 2 marks)

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11 The line **L** has equation $y = 2x - 1$

The circle **C** has equation $x^2 + y^2 = 34$

L meets **C** at the points A and B.

(a) Show that the x-coordinates of A and B satisfy the equation $5x^2 - 4x - 33 = 0$

(2)

(b) Find the coordinates of A and B.

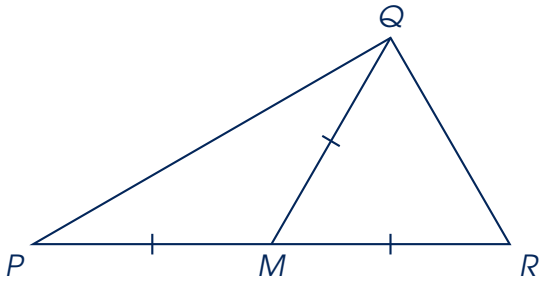
(..... , ...) and .....

(3)

(Total for Question 11 is 5 marks)

12 PQR is a triangle.

M is the point on PR such that $MP = MQ = MR$



Prove that angle $PQR = 90°$

(Total for Question 12 is 3 marks)

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13 A bag contains only red counters and blue counters.

There are 4 more blue counters than red counters in the bag.

Jack takes at random two counters from the bag, without replacement.

The probability that both counters are red is $\frac{1}{8}$

Work out the total number of counters in the bag.

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(Total for Question 13 is 4 marks)

TOTAL FOR PAPER IS 40 MARKS