NON-CALC D

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)** Work out $-3 \times (5-9)^2 + 20 \div (-4)$

.....

(2)

(b) Tom says,

"-4^2 is equal to 16"

Is Tom correct? Give a reason for your answer.

.....

.....

(1)

(Total for Question 1 is 3 marks)

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2 Some flowers in a garden are roses, tulips or daffodils.

$\frac{2}{5}$ of the flowers are roses.

The ratio of the number of tulips to the number of daffodils is 3 : 5

There are 6 more roses than daffodils.

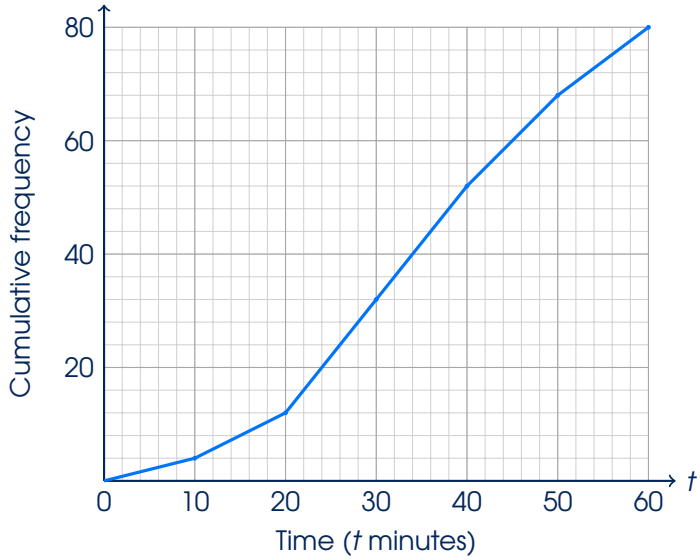
Work out the number of tulips in the garden.

.....

(Total for Question 2 is 4 marks)

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3 The cumulative frequency graph shows information about the times, in minutes, that 80 people took to complete a puzzle.



(a) Use the graph to find an estimate for the median time.

..... minutes

(1)

(b) Ellie says,

"The interquartile range of the times is less than 15 minutes."

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

(2)

(Total for Question 3 is 3 marks)

4 Solve $\frac{3x-1}{4} - \frac{x+2}{3} = 2$

$x =$ .....

(Total for Question 4 is 3 marks)

5 The diagram shows a lawn in the shape of a rectangle joined to a trapezium.

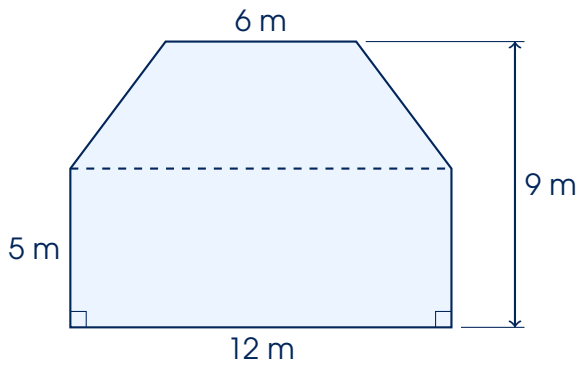


Diagram NOT accurately drawn

The top side of the lawn is parallel to the base.

Grass seed is sold in boxes. One box of grass seed covers 25 m^2 and costs £8

Work out the cost of buying enough boxes of grass seed to cover the lawn.

£ .....

(Total for Question 5 is 4 marks)

6 Here are the first four terms of a geometric sequence.

3	−6	**12**	−24

Priya says,

"768 is a term in this sequence."

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

.....

.....

(Total for Question 6 is 2 marks)

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7 **(a)** Work out the value of $\left(\frac{8}{27}\right)^{-\frac{2}{3}}$

.....

(2)

(b) Kai says,

"$25^{-\frac{1}{2}} = -5$"

Explain the mistake Kai has made.

.....

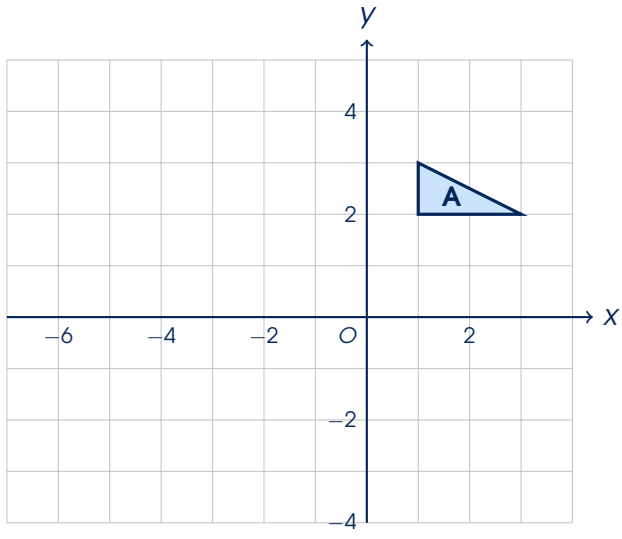
.....

(1)

(Total for Question 7 is 3 marks)

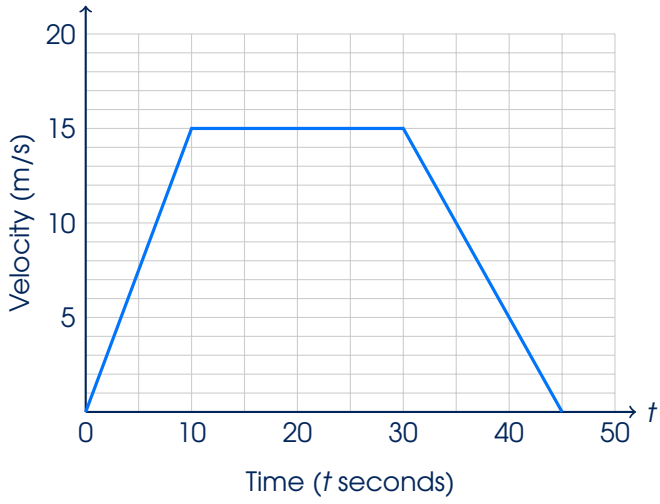
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8 Enlarge triangle **A** by scale factor -2, centre $(0,\ 1)$.



(Total for Question 8 is 2 marks)

9 Here is a velocity–time graph for a car journey of 45 seconds.



(a) Work out the acceleration of the car during the first 10 seconds.

..... m/s^2

(1)

(b) Show that the car travels less than 500 metres during the 45 seconds.

(2)

(Total for Question 9 is 3 marks)

10 Solve the inequality $2x^2 - 5x - 12 \leqslant 0$

.....

(Total for Question 10 is 3 marks)

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11 $f(x) = 3x - 2 \qquad g(x) = x^2 + 1$

(a) Show that $fg(x) = 3x^2 + 1$

(1)

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

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

(2)

(Total for Question 11 is 3 marks)

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12 The point $P(2, -4)$ lies on the circle with equation $x^2 + y^2 = 20$

The tangent to the circle at P meets the x-axis at the point Q.

Find the coordinates of Q.

(.....)

(Total for Question 12 is 3 marks)

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13 A bag contains n counters. 4 of the counters are red and the rest are blue.

Lily takes two counters at random from the bag without replacement.

The probability that both counters are blue is $\frac{1}{3}$

(a) Show that $n^2 - 13n + 30 = 0$

(2)

(b) Work out the probability that both of Lily's counters are red.

.....

(2)

(Total for Question 13 is 4 marks)

TOTAL FOR PAPER IS 40 MARKS