

Ratio, proportion and rate of change – GCSE Mathematics**1. No.3**

A chef has a tub of blueberries.

She wants to

use all the blueberries

put the same number of blueberries on each dessert.

$$D = \frac{k}{b}$$

 D is the number of desserts. b is the number of blueberries on each dessert.**(a)** What does the constant k represent?

Tick the correct box.

[1 mark]
☐

The number of blueberries in the tub

☐

The number of desserts

☐

The number of blueberries on each dessert

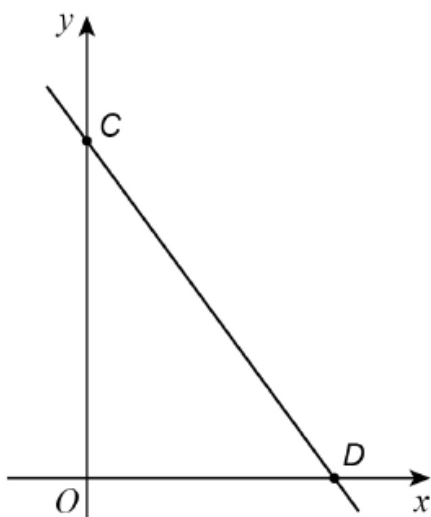
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None of the above

(b) Complete the table.**[2 marks]**

b	2	6	
D	120		30

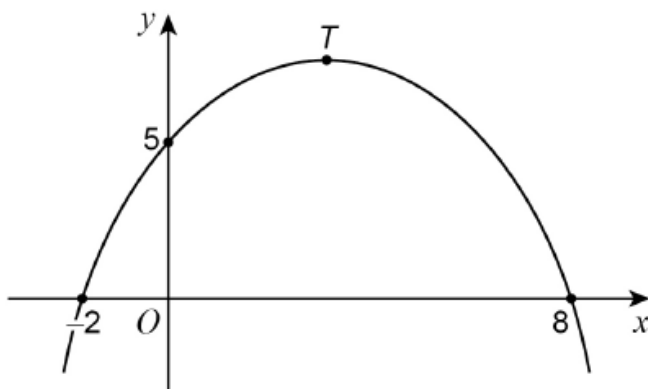
2. No.5

(a) Here is a sketch of the graph $y = -2x + 6$ Complete the coordinates of C and D .

[2 marks]

 $C(0, \underline{\hspace{2cm}})$ $D(\underline{\hspace{2cm}}, 0)$

(b) Here is a sketch of a quadratic graph.



Complete the following statements.

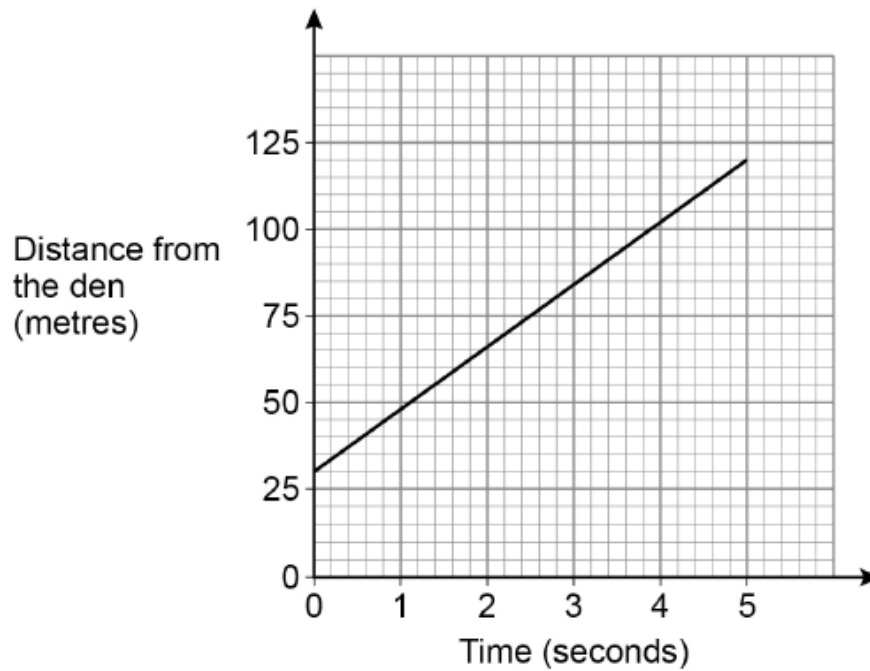
[2 marks]

The value of the y -intercept is $\underline{\hspace{2cm}}$ The x -coordinate of the turning point, T , is $\underline{\hspace{2cm}}$

3. No.8

A lion is sprinting in a straight line away from its den.

The graph shows the lion's distance from the den.



Work out the speed of the lion in metres per second.

[3 marks]

Answer _____ m/s

4. No.14

A graph passes through the points (3, 15) and (7, w)

- (a) Assume that the equation of the graph has the form $y = x^2 + c$

Work out the value of w that this would give.

[3 marks]

$w =$ _____

- (b) In fact, the graph is a straight line.

What does this mean about the actual value of w ?

Tick **one** box.

[1 mark]

☐

It must be the same as the value in part (a)

☐

It must be different to the value in part (a)

☐

It is impossible to tell

5. No.21

People in a stadium are in the North Stand, East Stand, South Stand or West Stand.

Of the people in the stadium,

$\frac{1}{4}$ are in the North Stand

$\frac{3}{10}$ are in the East Stand

number in South Stand : number in West Stand = 2 : 7

There are 4480 people in the West Stand.

How many people are in the stadium?

[4 marks]

Answer _____

6. No.6

(a) On Monday, Larrs swims 50 metres in 40 **seconds** at a constant speed.

On Tuesday, Larrs swims 1.5 kilometres.

Assume he swims at the same constant speed as on Monday.

How many **minutes** does he swim for on Tuesday?

[5 marks]

Answer _____ minutes

(b) In fact, on Tuesday Larrs swims at a slower constant speed than on Monday.

What does this mean about the number of minutes he swims for on Tuesday?

Tick the correct box.

[1 mark]

☐

It is less than the answer to part (a)

☐

It is the same as the answer to part (a)

☐

It is greater than the answer to part (a)

☐

It is not possible to say

7. No.9

Town A has

a population of 84 000

an area of 7 square miles.

Town B has a population density of 4695 people per square kilometre.

$$\text{Population density} = \frac{\text{population}}{\text{area}}$$

Which town has the greater population density?

Use 1 square mile = 2.6 square kilometres

Tick a box.

Town A

☐

Town B

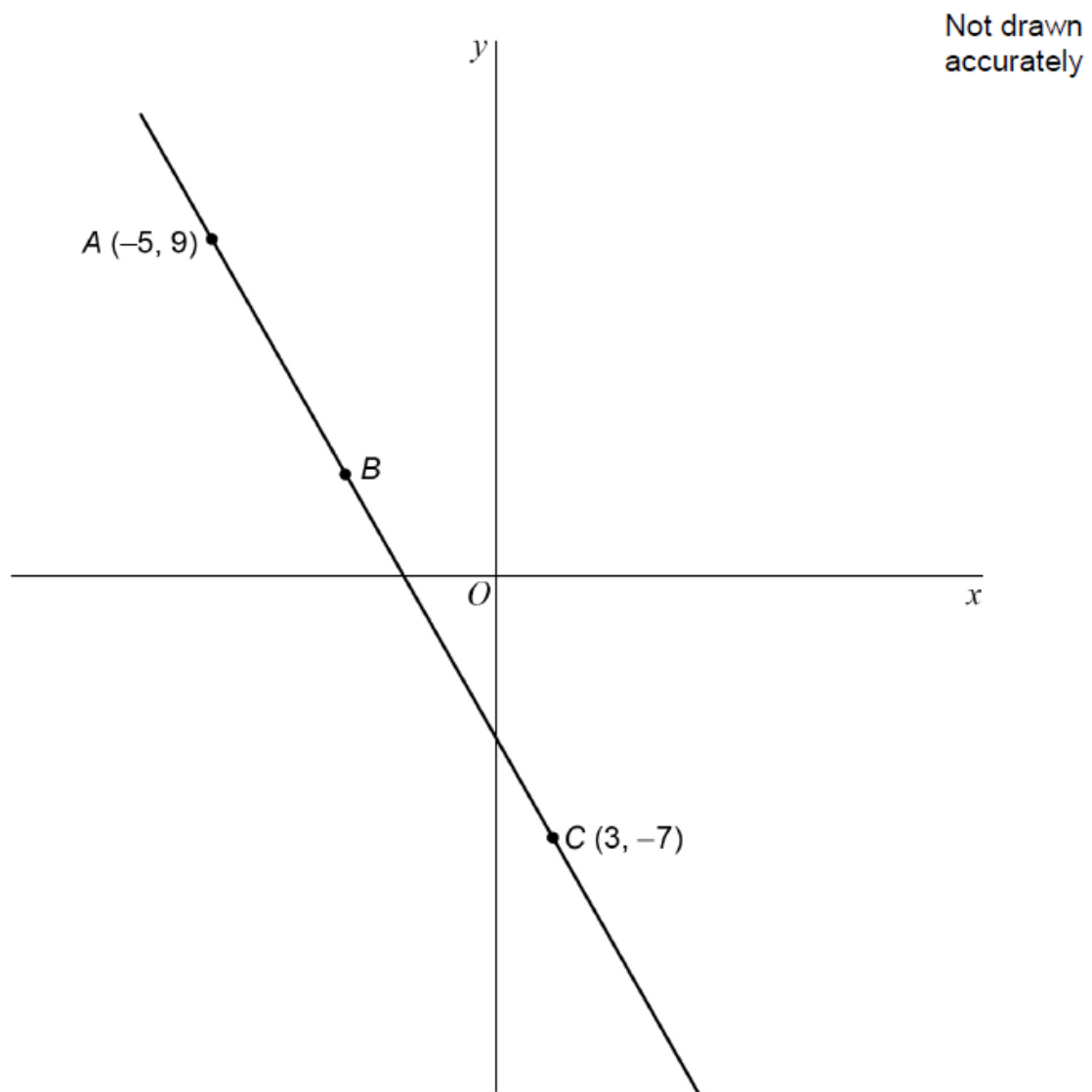
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Show working to support your answer.

[3 marks]

8. No.15

A straight line passes through points $A (-5, 9)$, B and $C (3, -7)$.



(a) $AB : BC = 1 : 3$

Work out the coordinates of point B .

[3 marks]

Answer (_____ , _____)

- (b) Work out the equation of the line perpendicular to AC that passes through C.

[4 marks]

Answer _____

9. No.20

P , Q , and R have positive values.

P is directly proportional to Q

When $P = 8$, $Q = 2$

R is inversely proportional to Q^2

When $R = 10$, $Q = 3$

Work out the value of R when $P = 0.5$

[5 marks]

$R =$ _____