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Topical Worksheets for Cambridge O LEVEL Mathematics D (4024)

Practice paper (40 marks)

1st edition, for examination until 2025

1 Line L passes through the points $(0, -3)$ and $(6, 9)$.

(a) Find the equation of line L.

..... [3]

(b) Find the equation of the line that is perpendicular to line L and passes through the point $(0, 2)$.

..... [2]

[Total: 5]

2 A is the point $(7, 12)$ and B is the point $(2, -1)$.

Find the length of AB.

..... [3]

[Total: 3]

3 A straight line joins the points A $(-2, -3)$ and C $(1, 9)$.

(a) Find the equation of the line AC in the form $y = mx + c$.

$y =$ ..... [3]

(b) Calculate the acute angle between AC and the x-axis.

..... [2]

(c) $ABCD$ is a kite, where AC is the longer diagonal of the kite.
B is the point (3.5, 2).

(i) Find the equation of the line BD in the form $y = mx + c$.

$y =$ ..... [3]

(ii) The diagonals AC and BD intersect at (–0.5, 3).

Work out the co-ordinates of D.

(..... , ...) [2]

[Total: 10]

4 The scale of a map is 1 : 10 000 000.
On the map, the area of Slovakia is 4.9 cm^2.

Calculate the actual area of Slovakia.
Give your answer in square kilometres.

..... km^2 [3]

[Total: 3]

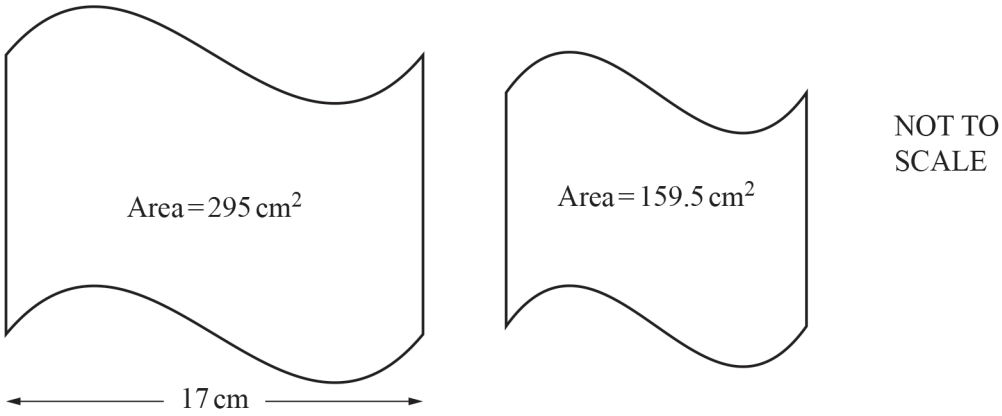
5 A model of a car has a scale 1 : 20.
The volume of the actual car is 12 m^3.

Find the volume of the model.
Give your answer in cubic centimetres.

..... cm^3 [3]

[Total: 3]

6



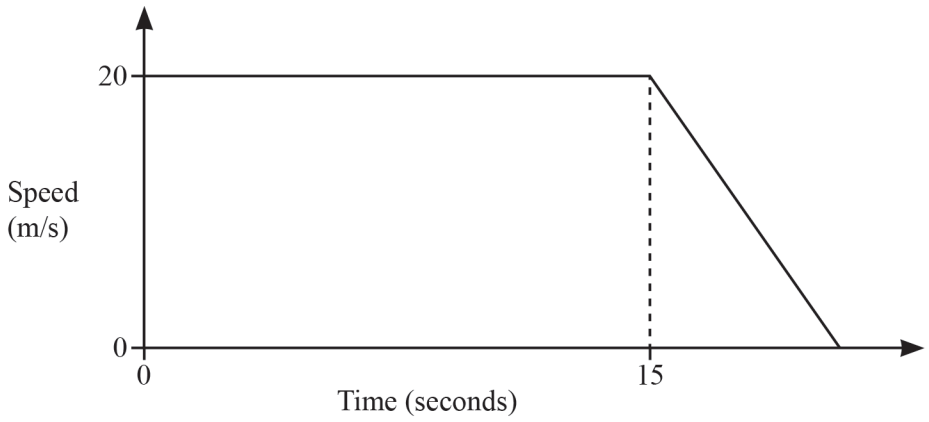
The diagram shows two mathematically similar shapes with areas 295 cm^2 and 159.5 cm^2.
The width of the larger shape is 17 cm.

Calculate the width of the smaller shape.

..... cm [3]

[Total: 3]

7



A car travels at 20 m/s for 15 seconds before it comes to rest by decelerating at 2.5 m/s^2.

Find the total distance travelled.

..... m [5]

[Total: 5]

8 $P = 2r + \pi r$

Rearrange the formula to write r in terms of P and π.

$r =$ ..... [2]

[Total: 2]

9 $f(x) = 3x - 5 \quad g(x) = 2^x$

(a) Find $fg(3)$.

..... [2]

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

$f^{-1}(x) =$ ..... [2]

[Total: 4]

10 $f(x) = 2x + 3$

Find $f(1 - x)$ in its simplest form.

..... [2]

[Total: 2]