

Problems on similar shapes with algebra

Grade 9 | Higher | 8 questions, 32 marks

GCSE Maths topic practice



Scan for the solutions

Name: _____ **Date:** _____ **Score:** _____ / 32

- 1** Two shapes are mathematically similar. The smaller has area 12 cm^2 and the larger has area 27 cm^2 . A side of the smaller shape is 4 cm long.

Work out the length of the matching side of the larger shape.

(2 marks)

Answer _____

- 2** Triangle P and triangle Q are mathematically similar. Triangle P has area 20 cm^2 and base x cm. Triangle Q has area 45 cm^2 and the matching base is $(x + 3)$ cm.

Work out the value of x .

(4 marks)

Answer _____

- 3** Two solid shapes are mathematically similar. The smaller has volume 54 cm^3 and height 6 cm. The larger has volume 250 cm^3 and height $(2x + 4)$ cm.

Work out the value of x .

(4 marks)

Answer _____

- 4 In triangle ABC, D lies on AB and E lies on AC so that DE is parallel to BC.

$AD : DB = 2 : 1$.

The area of triangle ADE is 24 cm^2 .

Work out the area of the trapezium DBCE.

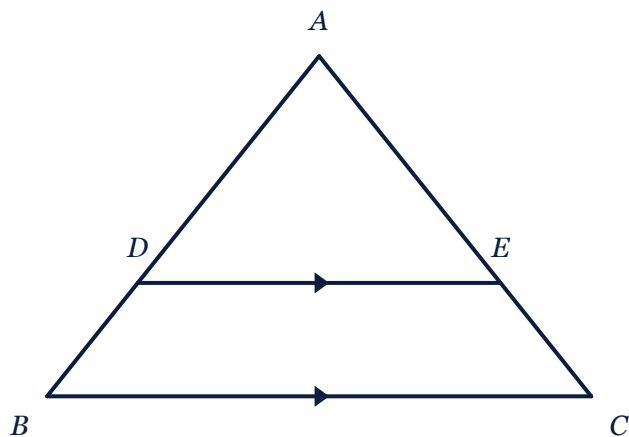


Diagram NOT accurately drawn

(4 marks)

Answer _____

- 5 Two rectangles are mathematically similar. The smaller has area 36 cm^2 and the larger has area 100 cm^2 . The length of the smaller is $(x + 1) \text{ cm}$ and the matching length of the larger is $2x \text{ cm}$.

Work out the value of x and the two lengths.

(4 marks)

Answer _____

- 6 In triangle ABC, the point D is on AB and the point E is on AC so that DE is parallel to BC.
AD = x cm and AB = $3x$ cm.
The area of triangle ADE is A cm².
Show that the area of the trapezium DBCE is $8A$ cm².

(4 marks)

Answer _____

- 7 Two mathematically similar containers, A and B, have volumes 400 cm³ and 1350 cm³.
a. Container A has height 12 cm. Work out the height of container B.
b. Container B has surface area 468 cm². Work out the surface area of container A.

(5 marks)

Answer _____

- 8 Two solid shapes, S and T, are mathematically similar. Their volumes are in the ratio 8 : 27.
The height of S is x cm and the height of T is $(x + 4)$ cm. The surface area of S is 96 cm².
a. Work out the value of x .
b. Work out the surface area of T.

(5 marks)

Answer _____

End of questions | Total 32 marks