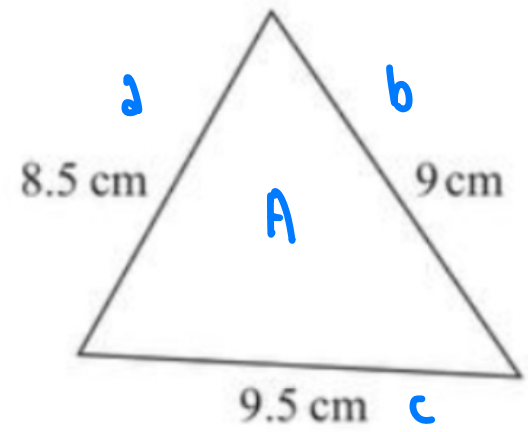
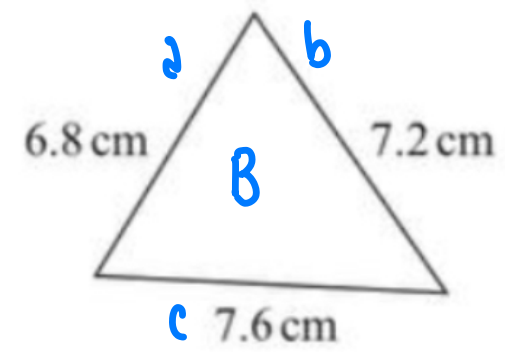
Similarity and congruency

1





The diagram shows two triangles.

Show that the triangles are similar.

Triangle A

a : b : c

8.5 . 9 : 9.5

17 : 18 : 19

Triangle B

a : b : c

6.8 : 7.2 . 7.6

34 : 36 : 38

17 : 18 : 19

∴ The triangles are similar.

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2 A company makes two sizes of containers, small and large.

Each small container is similar to each large container.

The volume of each small container is $225\,cm^3$
The volume of each large container is $650\,cm^3$

Given that the height of each large container is 18 cm,

calculate the height, in cm to 3 significant figures, of each small container.

x : height of small container

$$\left(\frac{x}{18}\right)^3 = \frac{225}{650}$$

$$\frac{x^3}{5832} = \frac{225}{650}$$

$$x^3 = \frac{225}{650} \times 5832$$

$$= \frac{26244}{13}$$

$$x = \sqrt[3]{\frac{26244}{13}}$$

$$= 12.6\,cm$$

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3 **A** and **B** are two similar solids.

The volume of **A** is $500\,cm^3$
The volume of **B** is $32\,cm^3$

The total surface area of **A** is $250\,cm^2$

Calculate the total surface area, in cm^2, of **B**.

$$\left(\frac{x}{250}\right)^3 = \left(\frac{32}{500}\right)^2$$

$$\frac{x^3}{15625\,000} = \frac{1024}{250\,000}$$

$$x^3 = 64\,000$$

$$x = \sqrt[3]{64\,000}$$

$$= 40\,cm^2$$

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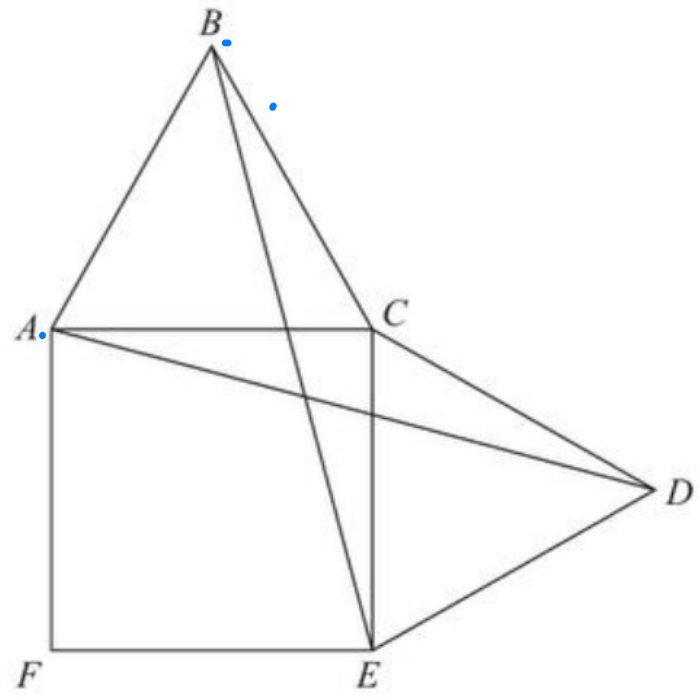
4



The diagram shows the square $ACEF$ and the equilateral triangles ABC and CDE

Prove that ΔECB is congruent to ΔACD

In ΔECB & ΔACD

AC = CE = sides of square ACEF

BC = CD = sides of equilateral triangles are equal.

∠ECB = ∠ACD (both obtuse angles = sum of right angle + angle at the equilateral triangle base).

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