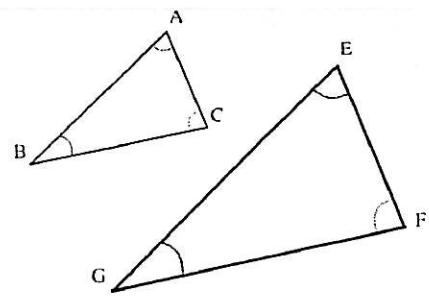


- In an **enlargement**, the object and the image are similar,
- The angles stay the same
  - The lengths increase in proportion



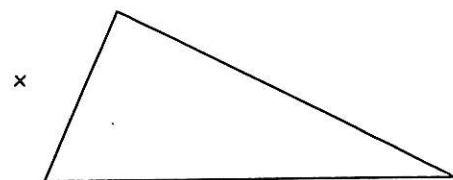
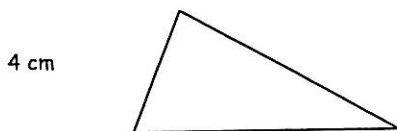
You use corresponding lengths to find the **scale factor**:

$$\text{scale factor} = \frac{\text{length of image}}{\text{length of object}}$$

Two D-shapes are similar if:

- Corresponding angles are equal
- Corresponding sides are in the same ratio

Example. These triangles are similar. Find the length  $x$ .

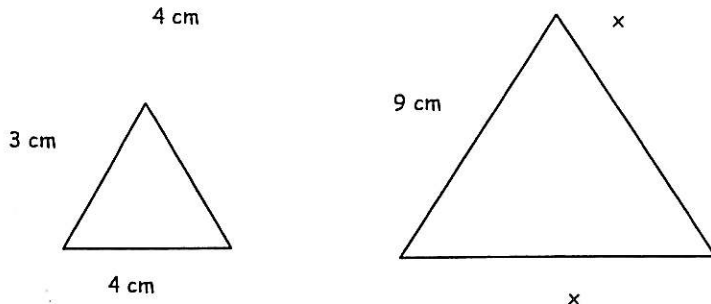
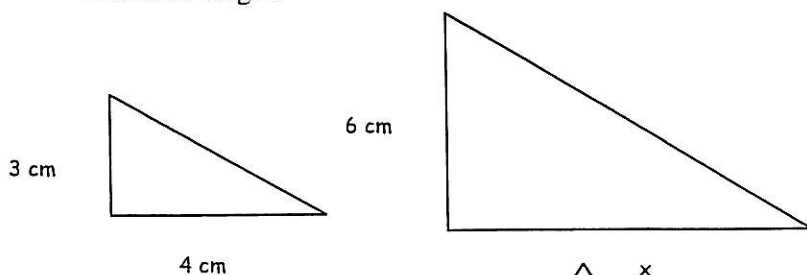


$$\frac{4}{x} = \frac{6}{15} \rightarrow x = \frac{4 \cdot 15}{6} = 10 \text{ cm}$$

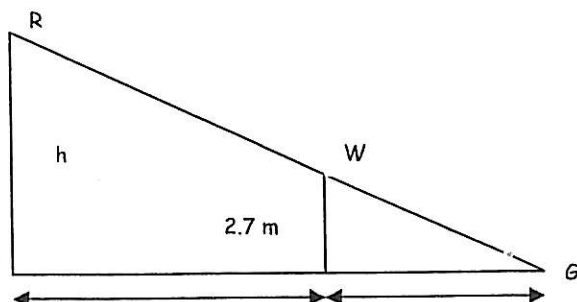
The scale factor is  $15/6$ .

## EXERCISES

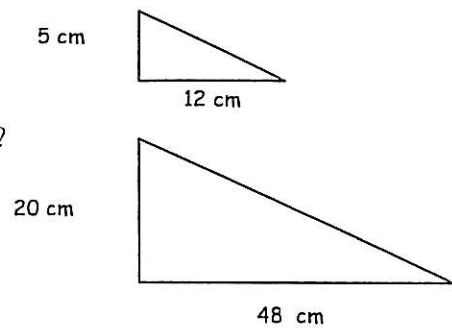
1. In each question, the two triangles are similar. Calculate the scale factor of the enlargement and the unknown length.



2. Gary, G, can just see the top of a radio mast, R, over a wall, W. Gary is 15 m from the wall. The wall is 45 m from the radio mast. The wall is 2.7 m high. Calculate the height of the radio mast (marked  $h$  on the diagram).

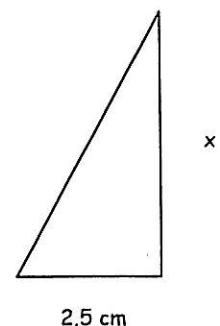


3. These two triangles are similar.
- Find the perimeter and area of each triangle
  - What is the ratio of the two perimeters?
  - What is the ratio of the two areas?
  - What can you notice about your answers to b and c?



If a shape is enlarged with scale factor  $k$ , its area is increased by a scale factor  $k^2$ .

- A photograph is being enlarged by a scale factor 3. If the original area of the print was  $24 \text{ cm}^2$ , what is the new area of the photograph?
- Two similar triangles have areas of  $16 \text{ cm}^2$  and  $40 \text{ cm}^2$ . If the base of the smaller triangle is 4 cm, find the base of the larger triangle.
- You walk due north for 4.5 km, then due east for 7.8 km. What distance are you from your starting point?
- Calculate the perpendicular height of this right-angled triangle. Calculate the perimeter and the area of this triangle as well:



- Find the height of an isosceles triangle where the base is 20 cm long, and the equal sides measure 26 cm each.

- Visit the website <http://lgfl.skool.co.uk/keystage3.aspx?id=65>, and click on the tips 15, 16, 17 and 18, all related to Pythagoras' theorem. Listen carefully and try to answer all the questions.