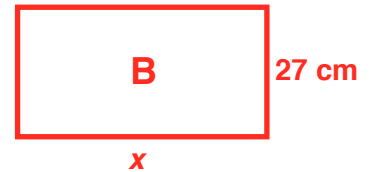


Similar Shapes

Starter

1. **Rectangle B** is an enlargement of **rectangle A**.
Calculate the value of length x .



2. The height of triangle P is 6 cm and the corresponding height on triangle Q is 24 cm.
(a) State the length factor from P to Q .
(b) State the length factor from Q to P .

Notes

Similar shapes are the **same shape** but a **different size** i.e. one shape is an **enlargement** of the other. The lengths of one shapes are **multiplied by the length factor** to get the lengths on the enlarged shape.

In similar shapes, **corresponding angles are equal**.

The key to solving these problems is remembering:

“The length factor from a to b is b over a .”

i.e. “from a to b is $\frac{b}{a}$ ”

E.g. The length factor from 4 to 28 is $\frac{28}{4} = 7$.

The length factor from 28 to 4 is $\frac{4}{28} = \frac{1}{7}$.

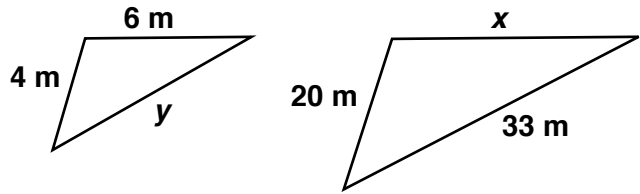
N.B. From the **small** shape **to** the **big** shape: length factor is greater than 1
From the **big** shape **to** the **small** shape: length factor is less than 1

Success criteria – using the length factor to find unknown lengths

1. By recognising which sides are corresponding, work out the **length factor** in each direction (small to big and big to small).
2. Draw arrows from corresponding sides **towards the unknowns**
3. When calculating missing lengths, we always go **towards the unknown** (just like life)

N.B. The length factor **multiplies** the length.

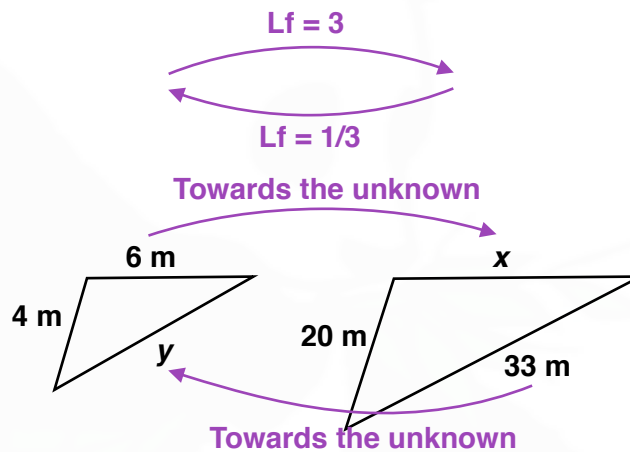
E.g. 1 The two triangles are similar.
Find the missing lengths on the triangles.



Working: The sides 4 and 20 are corresponding

Small to big: length factor from 4 to 20 is $\frac{20}{4} = 5$ > 1 since small to big

Big to small: length factor from 20 to 4 is $\frac{4}{20} = \frac{1}{5}$ < 1 since big to small

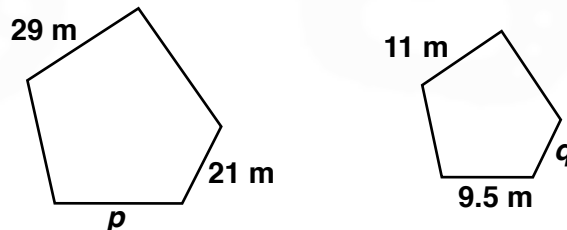


$$x = 6 \times 5 = 30 \quad \text{Go towards the unknown, } x$$

$$y = 33 \times \frac{1}{5} = \frac{33}{5} = 6.6 \quad \text{Go towards the unknown, } y$$

When the length factor is not an integer or an exact decimal, leave it **as a fraction** to avoid rounding errors.

E.g. 2 The two pentagons are similar. Find the missing lengths.



When the shape is rotated, use the marked angles to decide which sides correspond to each other.

E.g. 3 The two triangles are similar. Find the missing lengths.



Video: [Similar shapes - finding sides](#)

[Solutions to Starter and E.g.s](#)

Exercise

p137 Ex 19.2 Qu 1-7

Summary

Success criteria — using the length factor to find unknown lengths

1. By recognising which sides are corresponding, work out the *length factor* in each direction (small to big and big to small).
2. Draw arrows from corresponding sides *towards the unknowns*
3. When calculating missing lengths, we always go *towards the unknown* (just like life)

N.B. The length factor *multiplies* the length.

When the length factor is not an integer or an exact decimal, leave it *as a fraction* to avoid rounding errors.

When the shape is rotated, use the marked angles to decide which sides correspond to each other.