Y10 Maths Knowledge Organiser Foundation Tier: Congruency and Similarity

What must I be able to do?	Key vocabulary	

New content:
☐ Show that two shapes are similar
☐ Work out the scale factor between similar shapes
    ➤ Sparx U630
☐ Prove if two triangles are congruent
    ➤ Sparx U866, U790
	Similar shapes	Two shapes which are <u>enlargements</u> of each other. Their <u>angles</u> will be the <u>same</u> size but their <u>sides</u> will share a common <u>scale factor</u>.

	Congruent	Two shapes which are congruent are <u>identical</u> to each other.

Similar shapes

To calculate the length scale factor between 2 similar shapes:

length of one side on a shape ÷ length of the corresponding side on the second shape

9cm B 12cm

3cm A 4cm

Corresponding sides
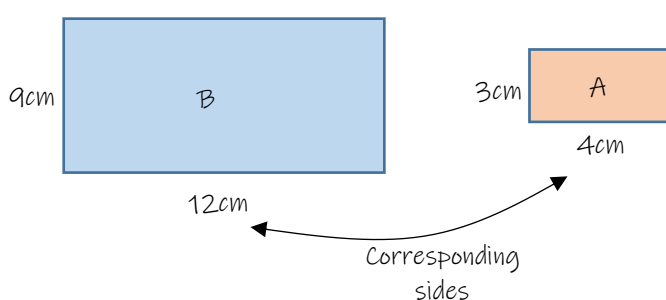
Here are 2 similar rectangles as:

$12 ÷ 4 = 3$ **and** $9 ÷ 3 = 3$

Both sides have the same length scale factor and the corresponding angles are the same in both shapes.

We would say to go from A to B has a length scale factor of 3, or to go from B to A has a length scale factor of $\frac{1}{3}$

Similar shapes can be embedded within other shapes and is often seen with triangles.
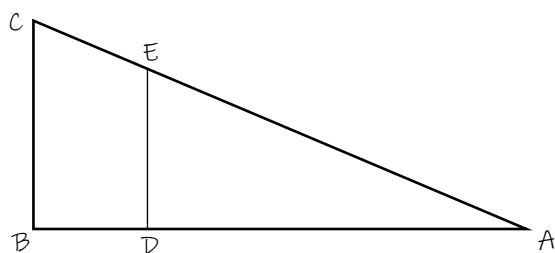
Provided that the lines BC and DE are parallel then the two triangles ABC and ADE are similar.

(If parallel then angle ACB = angle AED (corresponding angles) and angle ABC = angle ADE therefore all angles in the 2 triangles are equivalent)

Hint: Questions like these are often easier to solve by redrawing the triangles as 2 separate pictures.

Congruent Triangles/shapes

There are two styles of question with these. One is to identify which shapes are congruent. All sides and angles must be the same but the shape can be reflected or rotated.

The second type is to explain (prove) why 2 triangles are congruent. In order to do this you need to explain why 3 facts are the same about each triangle. This could involve using angle facts.

Specifically you need to explain one of these options:

1. Side, Angle, Side (SAS). Two sides with the angle inbetween them are the same in both triangles.
2. Angle, Side, Angle (ASA). One side and two angles are the same in both triangles.
3. Side, Side, Side (SSS). All 3 sides are the same in both triangles.
4. Right angle, Hypotenuse, Side (RHS). Both triangles have a right angle, the same hypotenuse and one other side the same.

Proving all 3 angles are the same is **not** proving they are congruent, as one could be an enlargement of the other. These would be similar triangles.