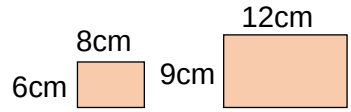
Year 10 – Similarity
Congruence, similarity & enlargement

Essential knowledge
- Enlarge by a positive or fractional scale factor
- Identify similar shapes
- Work out missing sides and angles in similar shapes
- Use parallel lines to find missing angles
- Similarity and congruence

Key Vocabulary
Enlarge: make a shape bigger or smaller by a multiplier / scale factor
Scale Factor (SF): the multiplier of enlargement
Centre of enlargement: the point the shape is enlarged from
Similar: when one shape can become another with a reflection, rotation, enlargement or translation.
Congruent: the same size and shape
Corresponding: items that appear in the same place in similar situations
Parallel: straight lines that never meet (equal gradients)

Prior learning links
Angles in parallel lines & polygons (Y8)
Constructions & congruency (Y9)
Enlargement & similarity (Y9)

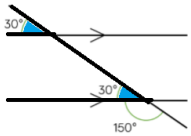
Identify similar shapes
Scale Factor (SF): Both sides on the bigger shape are 1.5 times bigger. Sides are in the same ratio.



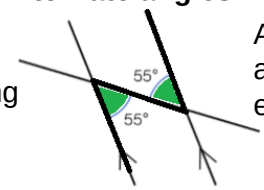
6 : 9
2 : 3

8 : 12
2 : 3

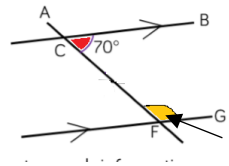
Angles in parallel lines

Corresponding angles


Corresponding angles are equal

Alternate angles


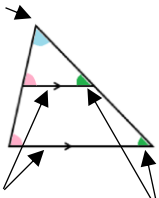
Alternate angles are equal

Co-interior angles


Because co-interior angles have a sum of 180° the highlighted angle is 110°

Similar triangles
As all angles are the same, these are similar triangles

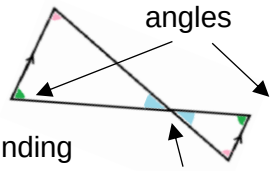
Share a vertex



Parallel lines – all angles will be the same in both triangles.

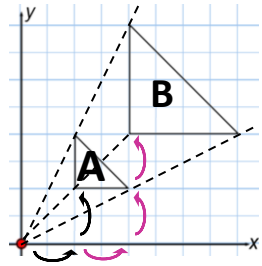
Corresponding angles are equal

Alternate angles



Vertically opposite angles

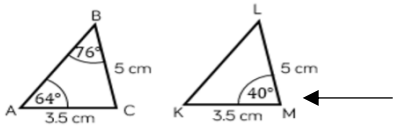
Positive scale factors
Enlargement from a point
Enlarge shape **A** by a SF of 2 from (0,0)



The shape is enlarged by a scale factor of 2

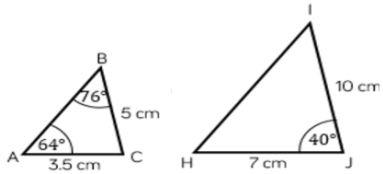
The distance from the point enlarges by a scale factor of 2

Congruence and similarity
Congruent shapes are **identical**



$A\hat{C}B = K\hat{M}L$

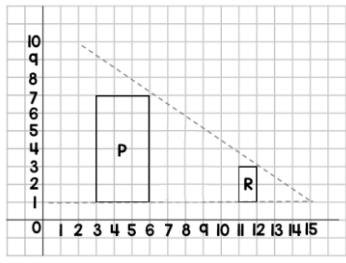
Because all the angles are the same and AC=KM BC=LM, triangles ABC and KLM are ***congruent***



Because all angles are the same, but all sides are enlarged by 2, ABC and HIJ are ***similar***

Fractional scale factors
Fractions less than 1 make a shape **smaller**

R is an enlargement of P by a scale factor $\frac{1}{3}$ from centre of enlargement (15,1)

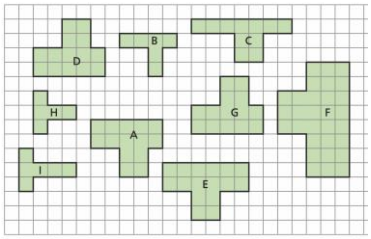


Scale Factor: $\frac{1}{3}$

R is three times smaller than P

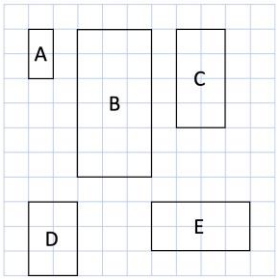
Year 10 – Similarity
Congruence, similarity & enlargement

Prior learning links



Which octagons are congruent to A?

Which rectangles are similar to rectangle A and what is the scale factor of enlargement?



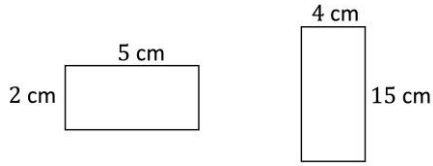
Key Vocabulary

Use cover, look, write, check to write the definitions …

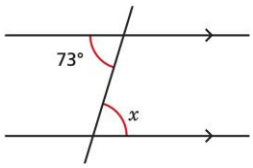
Enlarge:
Scale Factor:
Centre of enlargement:
Similar:
Congruent:
Corresponding:
Parallel:

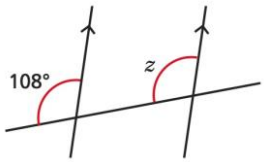
Identify similar shapes

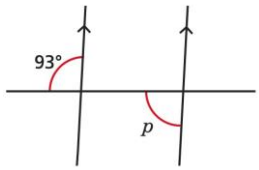
Explain why these rectangles **are not** similar.

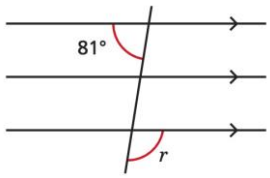


Angles in parallel lines (work out the size of angles x, z, p and r, giving reasons for your answers)







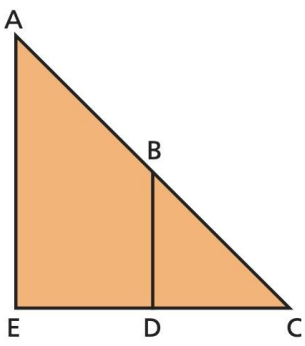


Similar triangles

In the diagram, AE and BD are parallel.
Complete the statements to show the angles that are equal.

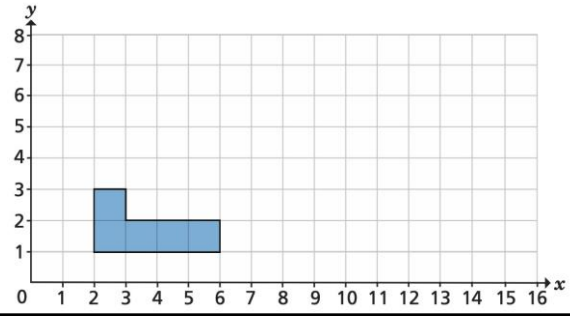
∠ AEC =
∠ EAC =
∠ ECA =

Are the triangles similar?



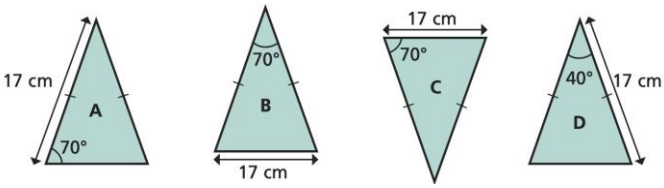
Positive scale factors

Enlarge the shape from the origin by a scale factor of 2



Congruence and similarity

1. Which triangle is congruent to triangle A?
2. Which triangle is similar to triangle A?



Fraction scale factors

Enlarge the shape by a scale factor of 0.5, using the centre of enlargement (–5, 6)