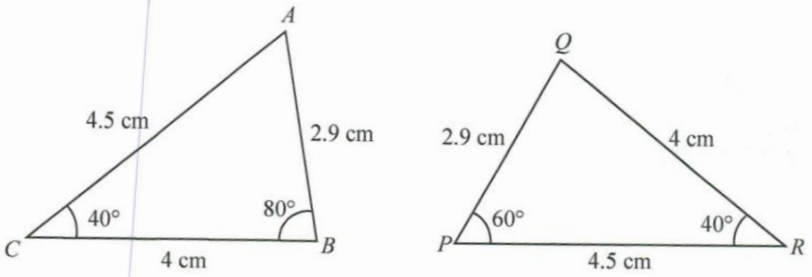
CHAPTER 7

Congruence and Similarity

Key Notes

7.1 Congruent Figures

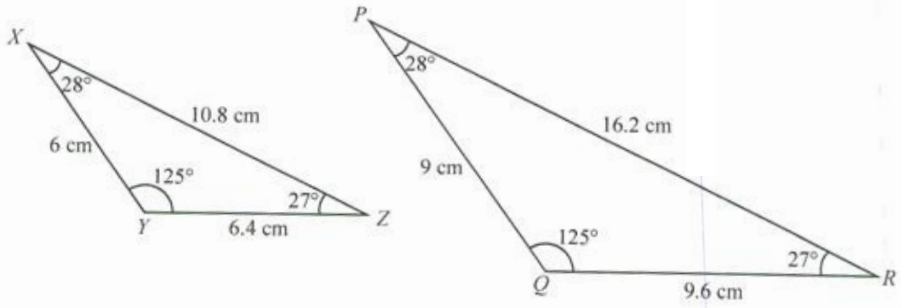
Congruent figures have the same size and shape. The corresponding angles and sides of congruent figures are equal.



$\triangle ABC \equiv \triangle PQR$
$AB = PQ$, $BC = QR$ and $AC = PR$
$\angle ABC = \angle PQR = 80°$
$\angle BAC = \angle QPR = 60°$
$\angle ACB = \angle PRQ = 40°$

7.2 Similar Figures

Similar figures have the same shape but may not have the same size. Corresponding angles are equal and the ratios of the corresponding sides are equal.



$\angle XYZ = \angle PQR = 125°$
$\angle YZX = \angle QRP = 27°$
$\angle ZXY = \angle RPQ = 28°$

$\frac{XY}{PQ} = \frac{6}{9} = \frac{2}{3}$

$\frac{YZ}{QR} = \frac{6.4}{9.6} = \frac{2}{3}$

$\frac{XZ}{PR} = \frac{10.8}{16.2} = \frac{2}{3}$

7.3 Scale Drawings

We can draw scale drawings, such as a map or floor plan, using a scale.

When the scale used is 1 : 50 000, 1 cm represents 50 000 cm.

1 cm : 50 000 cm
1 cm : 500 m
A distance of 1 cm on the map or floor plan represents an actual distance of 500 m.
An area of $(1 \times 1 =)$ 1 cm^2 on the map or floor plan represents an actual area of $(500 \times 500 =)$ 250 000 m^2.

For example, a given map has a scale of 1 : 45 000.
1 cm : 45 000 cm = 1 cm : 450 m
= 1 cm : 0.45 km
If the distance between town A and town B on the map is 20 cm, the actual distance between town A and town B = 20×0.45
= 9 km
1 cm^2 : 0.45^2 km^2 = 1 cm^2 : 0.2025 km^2
If the area of town A on the map is 3 cm^2, the actual area of town A = 3×0.2025
= 0.6075 km^2