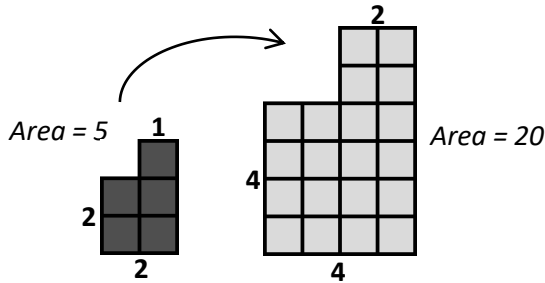


GEOMETRIC THINKING – SET 6 – PART 1

A Students can enlarge by a scale factor and describe the effect on area and volume.

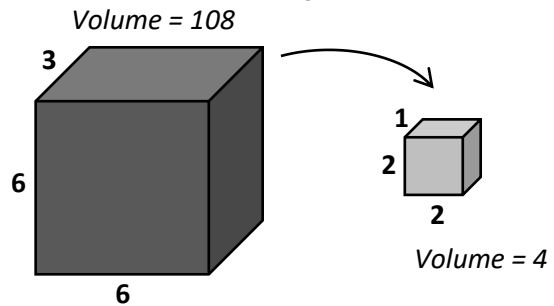
Enlarge by Scale Factor 2



What happened to the lengths and the area?

The lengths are all doubled, but the area is 4 times the size.

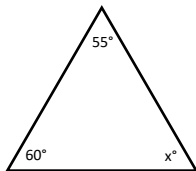
Enlarge by Scale Factor $\frac{1}{3}$



What happened to the volume?

The lengths are all divided by three, but the volume is divided by three cubed or 27.

B Knows basic angle rules

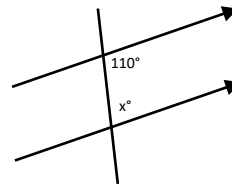


Angles in a triangle

add to 180°

$$x = 180 - 55 - 60$$

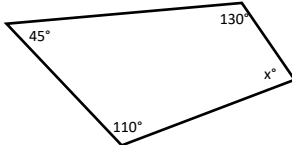
$$x = 65^\circ$$



Co-interior angles on parallel lines add to 180°

$$x = 180 - 110$$

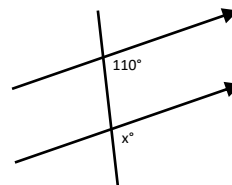
$$x = 70^\circ$$



Angles in a quadrilateral
add to 360°

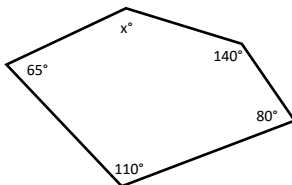
$$x = 360 - 45 - 110 - 130$$

$$x = 75^\circ$$



Corresponding angles on parallel lines are equal

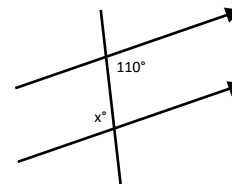
$$x = 110^\circ$$



Angles in a pentagon add to 540°

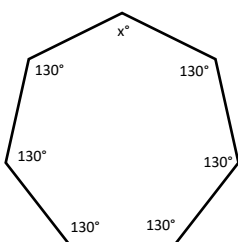
$$x = 540 - 65 - 110 - 140 - 80$$

$$x = 145^\circ$$



Alternate angles on parallel lines are equal

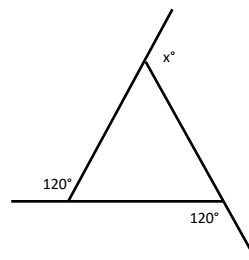
$$x = 110^\circ$$



Angles in a polygon add to $180 \times (n-2)$

$$x = 180 \times 5 - 130 \times 6$$

$$x = 120^\circ$$



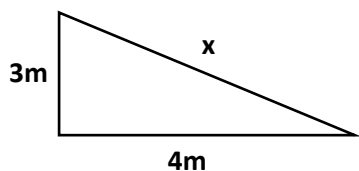
Exterior Angles add to 360°

$$x = 360 - 120 - 120$$

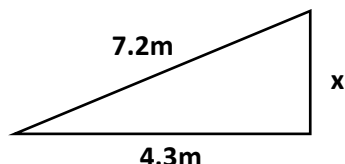
$$x = 120^\circ$$

GEOMETRIC THINKING – SET 6 – PART 2

© Can use Pythagoras' Theorem to find sides of right angle triangles.

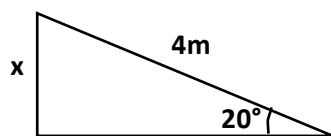


$$\begin{aligned} a^2 + b^2 &= c^2 \\ 4.3^2 + x^2 &= 7.2^2 \\ x^2 &= 33.35 \\ x &= 5.77\text{m (3sf)} \end{aligned}$$



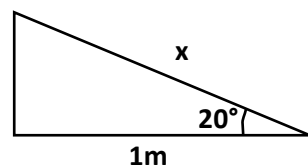
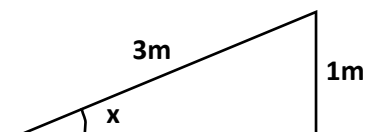
© Can use sin, cos and tan to find side lengths and angles in right angle triangles.

Note: only 6 of the 9 possible calculations are shown below.



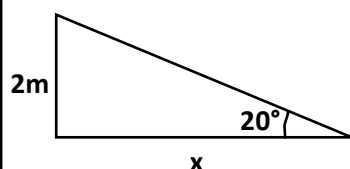
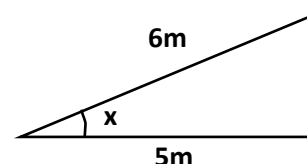
$$\begin{aligned} x &= \sin 20 \times 4 \\ x &= 1.37\text{m (3sf)} \end{aligned}$$

$$\begin{aligned} x &= \sin^{-1}(1 \div 3) \\ x &= 19.5^\circ \text{ (3sf)} \end{aligned}$$



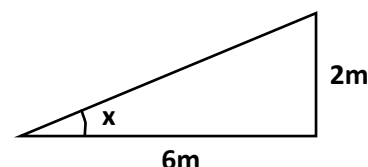
$$\begin{aligned} x &= 1 \div \cos 20 \\ x &= 1.06\text{m (3sf)} \end{aligned}$$

$$\begin{aligned} x &= \cos^{-1}(5 \div 6) \\ x &= 33.6^\circ \text{ (3sf)} \end{aligned}$$

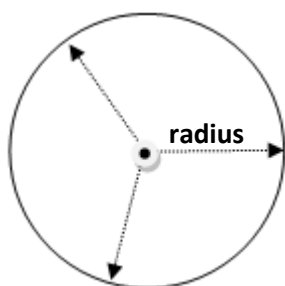


$$\begin{aligned} x &= 2 \div \tan 20 \\ x &= 5.49\text{m (3sf)} \end{aligned}$$

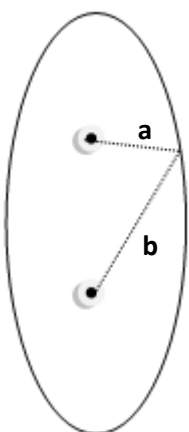
$$\begin{aligned} x &= \tan^{-1}(2 \div 6) \\ x &= 18.4^\circ \text{ (3sf)} \end{aligned}$$



© Can describe the loci of points for a circle and ellipse.



All points on a circle are the same distance from the centre. That distance is the radius.



All points on an ellipse share a common sum of distances (a+b) to two foci. As the foci close the ellipse "morphs" into a circle. The circle is just a special case of ellipse.