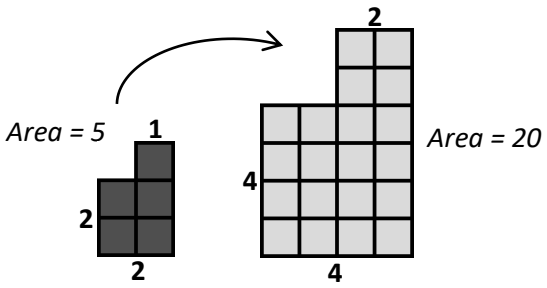
GEOMETRIC THINKING – SET 6 – PART 1

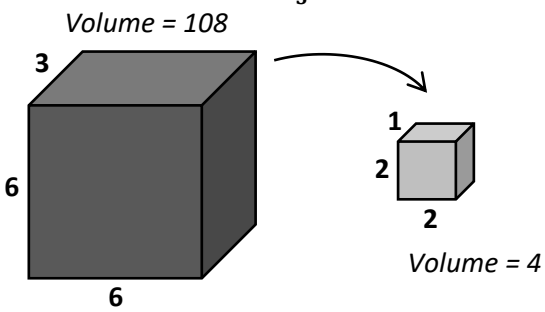
(A) *Students can enlarge by a scale factor and describe the effect on area and volume.*

Enlarge by Scale Factor 2



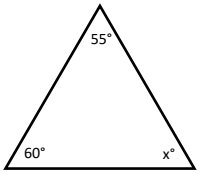
What happened to the lengths and the area?
The lengths are all doubled, but the area is 4 times the size.

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

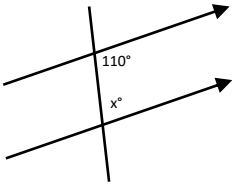


What happened to the volume?
The lengths are all divided by three, but the volume is divided by three cubed or 27.

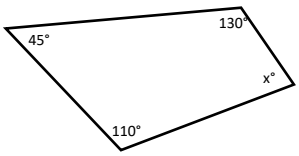
(B) *Knows basic angle rules*



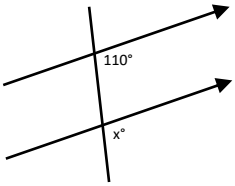
Angles in a triangle add to 180°
x = 180 – 55 – 60
x = 65°



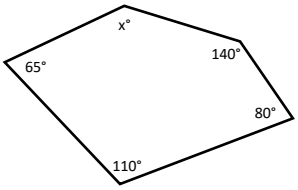
Co-interior angles on parallel lines add to 180°
x = 180 – 110
x = 70°



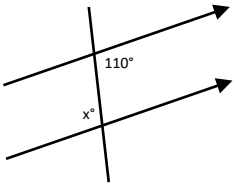
Angles in a quadrilateral add to 360°
x = 360 – 45 – 110 – 130
x = 75°



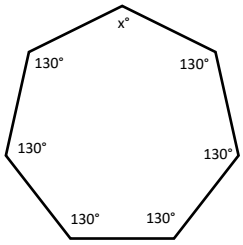
Corresponding angles on parallel lines are equal
x = 110°



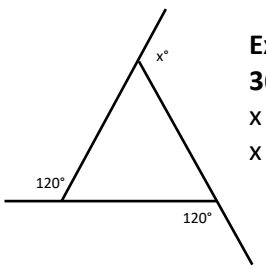
Angles in a pentagon add to 540°
x = 540 – 65 – 110 – 140 – 80
x = 145°



Alternate angles on parallel lines are equal
x = 110°



Angles in a polygon add to 180 × (n-2)
x = 180 × 5 – 130 × 6
x = 120°

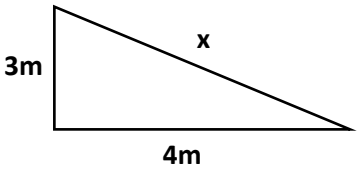


Exterior Angles add to 360°
x = 360 – 120 – 120
x = 120°

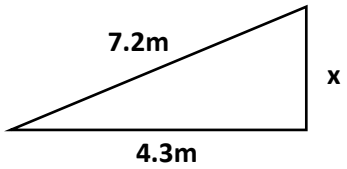
Jake Wills and Olivia Walker-Wills – 2020

GEOMETRIC THINKING – SET 6 – PART 2

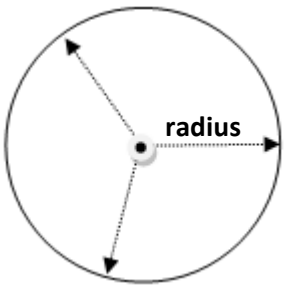
C *Can use Pythagoras' Theorem to find sides of right angle triangles.*



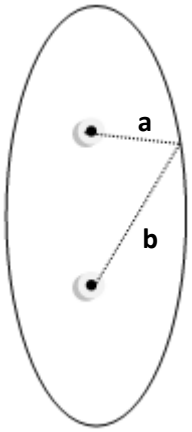
$a^2 + b^2 = c^2$
$4.3^2 + x^2 = 7.2^2$
$x^2 = 33.35$
$x = 5.77\text{m}$ (3sf)



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



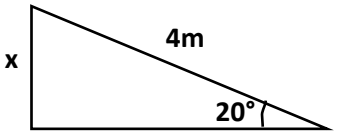
All points on a circle are the same distance from the centre. That distance is the radius.



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.

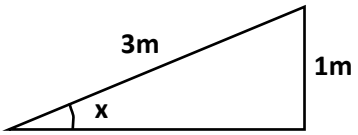
D *Can use sin, cos and tan to find side lengths and angles in right angle triangles.*

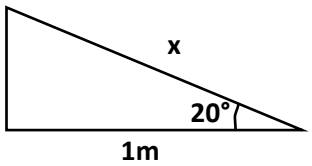
Note: only 6 of the 9 possible calculations are shown below.



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

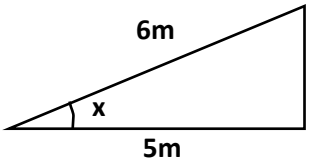
$x = \sin^{-1}(1 \div 3)$
$x = 19.5°$ (3sf)

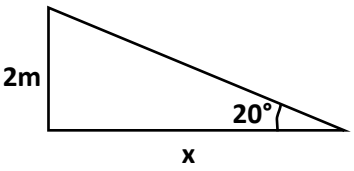




$x = 1 \div \cos 20$
$x = 1.06\text{m}$ (3sf)

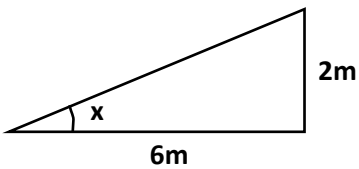
$x = \cos^{-1}(5 \div 6)$
$x = 33.6°$ (3sf)





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

$x = \tan^{-1}(2 \div 6)$
$x = 18.4°$ (3sf)



Jake Wills and Olivia Walker-Wills – 2020