

YEAR 10 — GEOMETRY...

Working with circles

What do I need to be able to do?

By the end of this unit you should be able to:

- Recognise and label parts of a circle
- Calculate fractional parts of a circle
- Calculate the length of an arc
- Calculate the area of a sector
- Understand and use volume of a cone, cylinder and sphere.
- Understand and use surface area of a cone, cylinder and sphere.

Keywords

Circumference: the length around the outside of the circle — the perimeter

Area: the size of the 2D surface

Diameter: the distance from one side of a circle to another through the centre

Radius: the distance from the centre to the circumference of the circle

Tangent: a straight line that touches the circumference of a circle

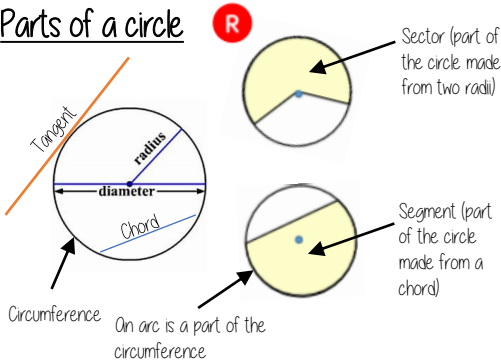
Chord: a line segment connecting two points on the curve

Frustrum: a pyramid or cone with the top cut off

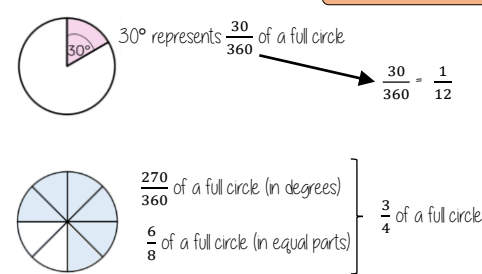
Hemisphere: half a sphere

Surface area: the total area of the surface of a 3D shape.

Parts of a circle



Fractional parts of a circle



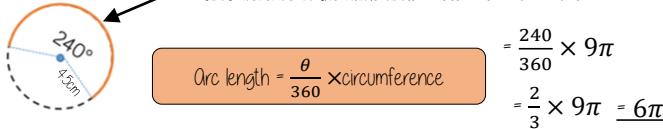
A circle is made up of 360°

Formula to remember:
Area of a circle = πr^2
Circumference of a circle = πd or $2\pi r$

The fraction of the circle is as $\frac{\theta}{360}$
 θ represents the degrees in the sector

Arc length

Remember an arc is part of the circumference
Circumference of the whole circle = $\pi d = \pi \times 9 = 9\pi$



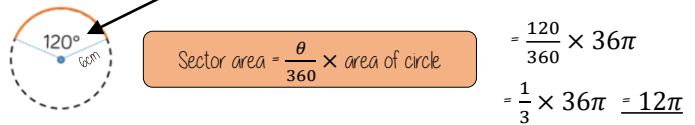
Perimeter

Perimeter is the length around the outside of the shape
This includes the arc length and the radii that enclose the shape

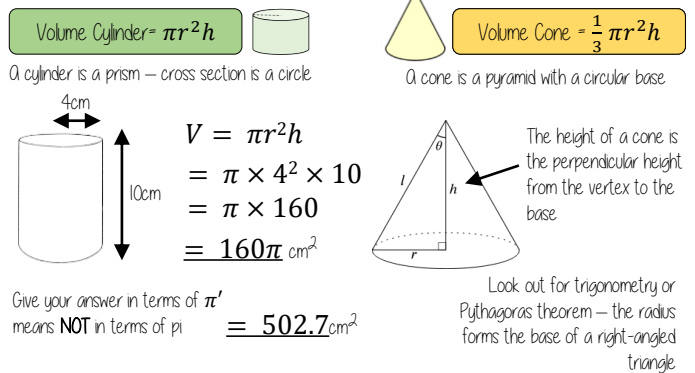
$$\text{Perimeter} = \frac{\theta}{360} \times \text{circumference} + 2r = 6\pi + 9$$

Sector area

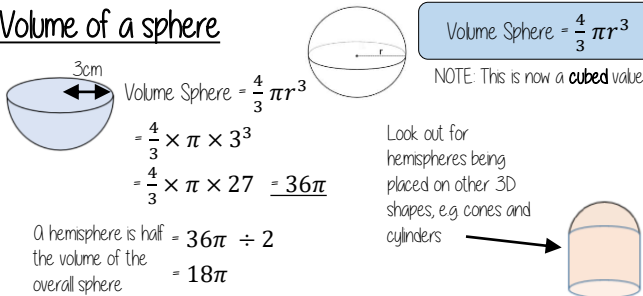
Remember a sector is part of a circle
Area of the whole circle = $\pi r^2 = \pi \times 6^2 = 36\pi$



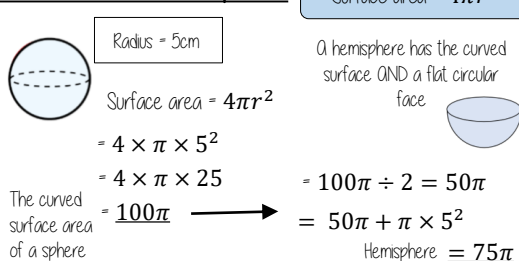
Volume of a cone and a cylinder



Volume of a sphere



Surface area of a sphere



Surface area of cones and cylinders

