

SHAPE

Spring Term

Shape 1

Topics

- Parts of a circle
- Area/circumference
- Area of a sector
- Arc length
- Area of compound shapes

What do I need to be able to do?

- Name the parts of a circle
- Find the area/circumference/arc length of a circle
- Find the area of a compound shape

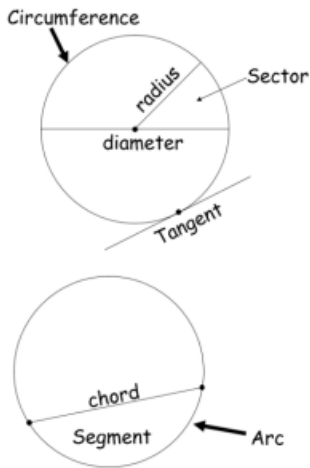
Key Vocabulary

Circle	A 2D shape made by drawing a curve that is always the same distance from a centre
Radius	The distance from the centre of the circle outwards
Diameter	The distance across the circle, through the centre
Area	The size of a surface
Circumference	The distance around the circle
Sector	A "pie slice" part of a circle
Segment	The part of a circle made when it is cut by a line
Tangent	A line that just touches a curve at a point
Chord	A line segment connecting two points on a curve
Arc	Part of the circumference of a circle
Compound	Made up of more than one shape

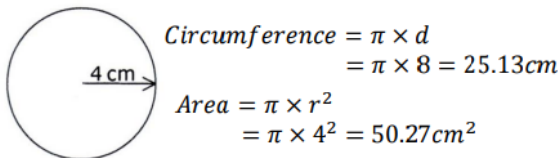
Career Links

Being able to confidently work with shape is a great skill to have and has lots of links with a number of careers such as:

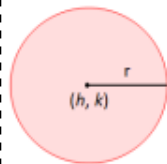
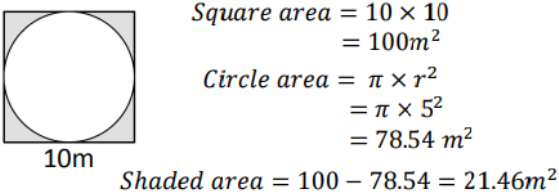
- Architecture
- Landscaping
- Engineering
- Construction
- Carpenter



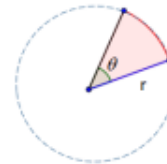
Find the area and circumference to 2dp.



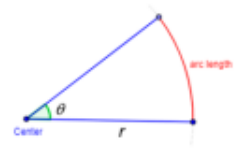
Find shaded area to 2dp.



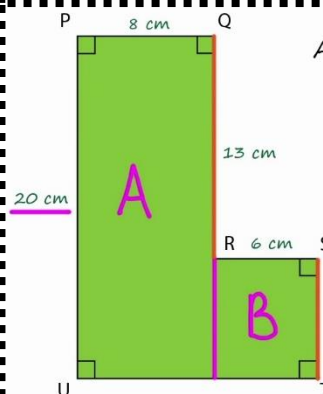
$area\ of\ circle = \pi r^2$
 $circumference = 2\pi r$



If θ is measured in degrees then
 $area\ of\ sector = \frac{\theta}{360} \times \pi r^2$

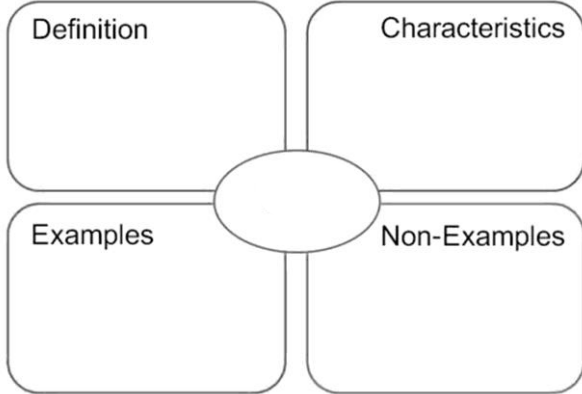


If θ is measured in degrees then
 $arc\ length = \frac{\theta}{360} \times 2\pi r$



Area of Figure = Area A + Area B

$Area\ A = 20cm \times 8cm$
 $= 160cm^2$



SHAPE

Spring Term

Shape 2

Career Links

Being able to confidently work with shape is a great skill to have and has lots of links with a number of careers such as:










- Architecture
- Landscaping
- Engineering
- Construction
- Carpenter

Topics

- Volume of prisms
- Surface area of prisms
- Volume/ surface area of a cylinder
- Volume/surface area of a cone
- Volume of a sphere
- Volume of a pyramid
- Surface area of a cone/sphere/pyramid

What do I need to be able to do?

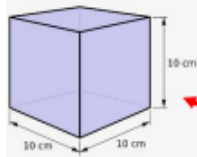
- Find the volume and surface area of different 3D shapes

 <p>Cube 6 square faces 12 edges 8 vertices</p>	 <p>Tetrahedron 4 triangular faces 6 edges 4 vertices</p>	 <p>Sphere 1 curved surface 0 edges 0 vertices</p>
 <p>Cuboid 6 faces 12 edges 8 vertices</p>	 <p>Octahedron 8 faces 12 edges 6 vertices</p>	 <p>Triangular prism 5 faces 9 edges 6 vertices</p>
 <p>Square-based pyramid 5 faces 8 edges 5 vertices</p>	 <p>Cone 1 circular face 1 curved surface 1 curved edge 1 apex</p>	 <p>Cylinder 2 circular faces 1 curved surface 2 curved edges 0 vertices</p>

Key Vocabulary

Prism	A solid object with two identical ends and flat sides
Surface area	The total area of the surface of a three dimensional object
Volume	The amount of 3 dimensional space something takes up
Cylinder	A solid object two identical flat ends that are circular and one curved side
Cone	A solid object that has a circular base joined to a point by a curved side
Sphere	A 3D object shaped like a ball
Pyramid	A solid object where the sides are triangles which meet at the top and the base is a polygon

Cubes: Find the area of one of the faces and then multiply by 6. This is because all of the faces of a cube are the same size.

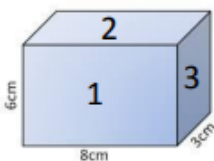


Area of 1 face = $10 \times 10 = 100\text{cm}^2$

Total surface area = $100 \times 6 = 600\text{cm}^2$

There are 6 faces with the same area.

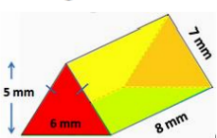
Cuboids: They have 3 pairs of faces. We need to find the area of each of the faces we can see, add them together and then double.



Face 1 = $8 \times 6 = 48\text{cm}^2$
Face 2 = $8 \times 3 = 24\text{cm}^2$
Face 3 = $3 \times 6 = 18\text{cm}^2$
Total = 90cm^2

Surface area = $2 \times 90 = 180\text{cm}^2$

Triangular prism: They have a pair of triangular sides and 3 rectangular sides



$\frac{6 \times 5}{2} = 15$

Surface area = $15 + 15 + 56 + 56 + 48 = 190\text{mm}^2$

$\frac{6 \times 5}{2} = 15$

Find the area of each face and then add together.

Definition

Characteristics

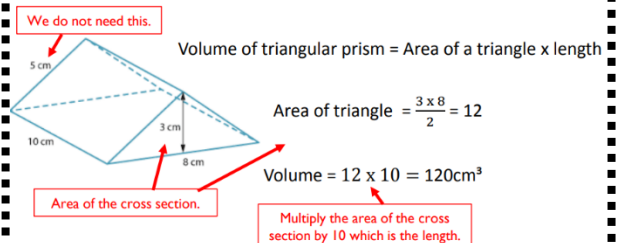
Examples

Non-Examples

Prism: A prism is a solid object with identical ends and flat faces.

The general formula for the volume of a prism is:

Volume = Area of the cross section \times Length



Year 9 F – Knowledge Organiser

