

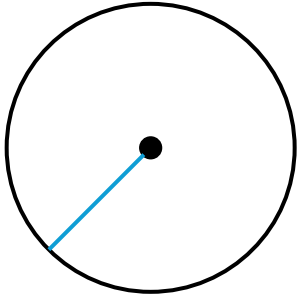
The background is a vibrant blue surface with several light grey diagonal lines intersecting. Scattered across this surface are various 3D geometric shapes in red, blue, and yellow. These include spheres of different sizes, cubes, and cones. A horizontal pink banner with a slight gradient runs across the middle of the image. The word "SHAPES" is written in large, white, bold, sans-serif capital letters across this banner. Each letter has a thin white outline and a subtle drop shadow, giving it a three-dimensional appearance as if it's floating above or attached to the banner.

SHAPES

Chapter 3: Circles

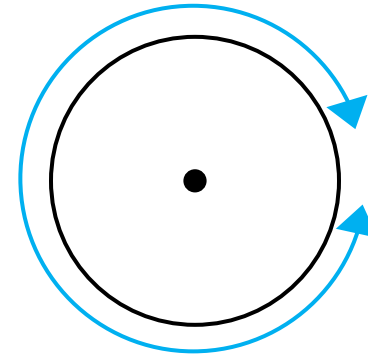
Parts of a Circle

Radius



A straight line that touches circumference of the circle

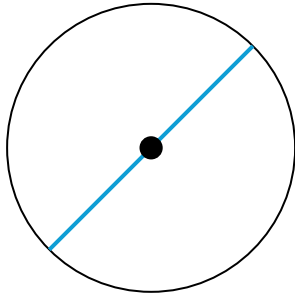
Circumference



Perimeter of a circle

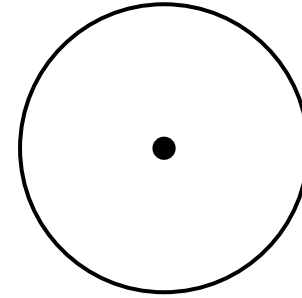
Parts of a Circle

Diameter



A straight line that touches circumference of the circle

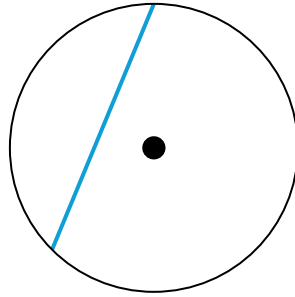
Centre



A fixed point where all points on the circumference are equidistance from it

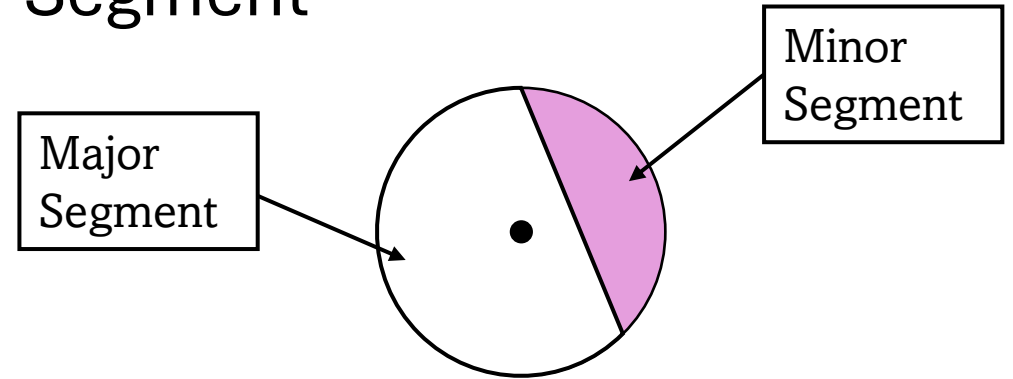
Parts of a Circle

Chord



A straight line that joins at any two points of circumference of the circle

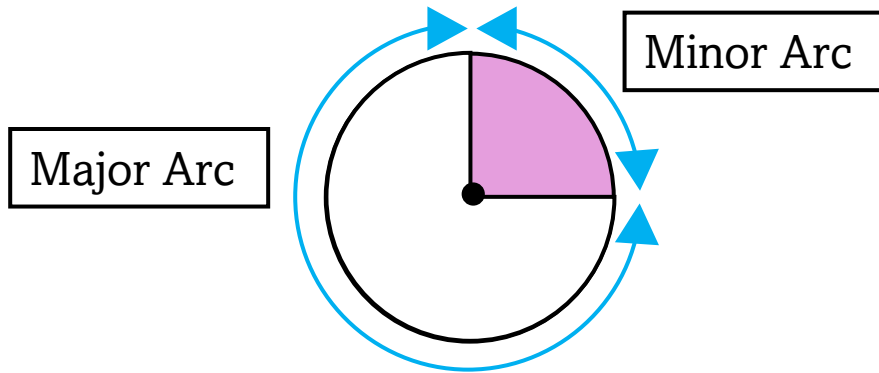
Segment



The region enclosed by a chord and an arc

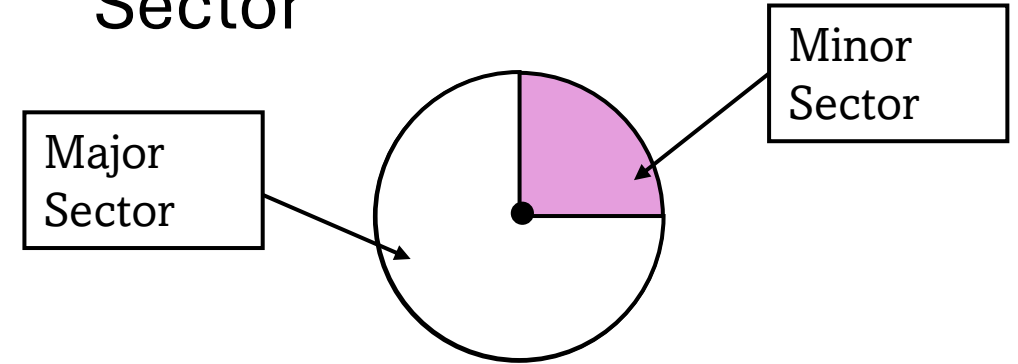
Parts of a Circle

Arc



Part of the circumference

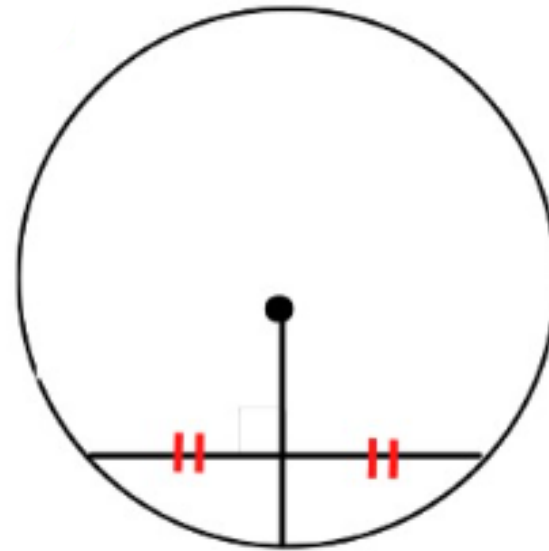
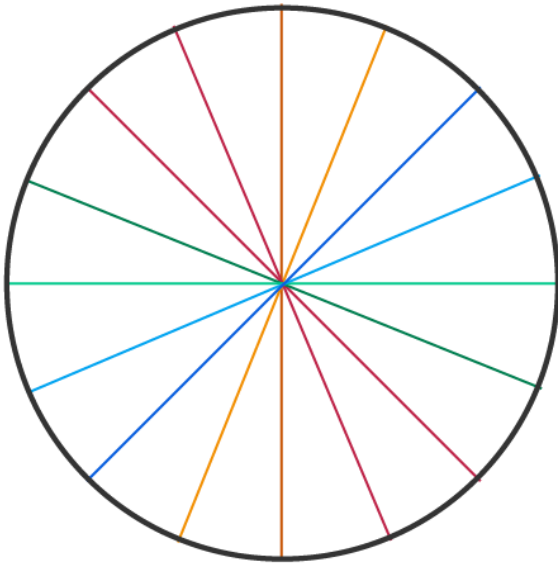
Sector



The region enclosed by two radii and an arc

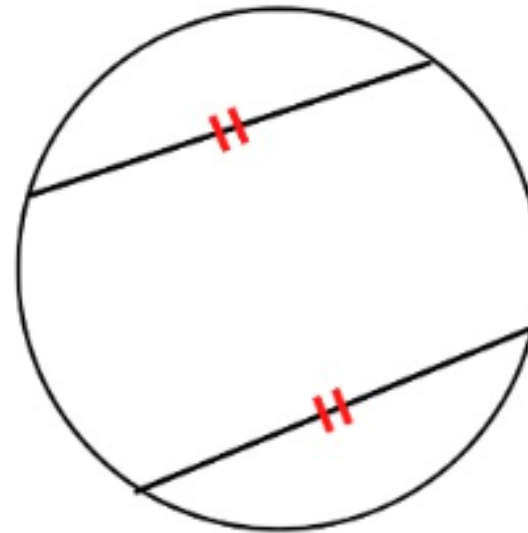
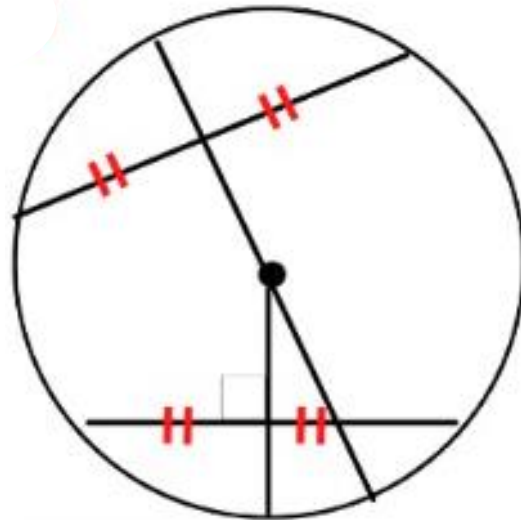
Symmetry & Chords

- The diameter of a circle is the axis of symmetry of the circle
- A radius which is a perpendicular to the chord bisects the chord



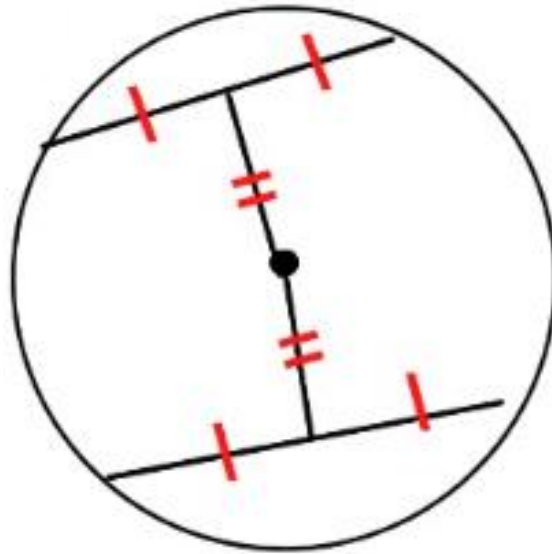
Symmetry & Chords

- Perpendicular bisectors of two chords meet at the centre of the circle
- Equal chords or chords of the same length produce arc of the same length



Symmetry & Chords

- Equal chords are equidistant from the centre of the circle
- A perpendicular bisector for any chord will always intersect at the centre of the circle



Area of Circles

- Ratio between circumference and diameter:

$$\frac{\text{Circumference}}{\text{Diameter}} = \pi = 3.142 = \frac{22}{7}$$

- Circumference = $\pi \times \textit{diameter}$

or

$$2 \times \textit{radius} \times \pi$$

Area of Circles

Area of circle = area of rectangle

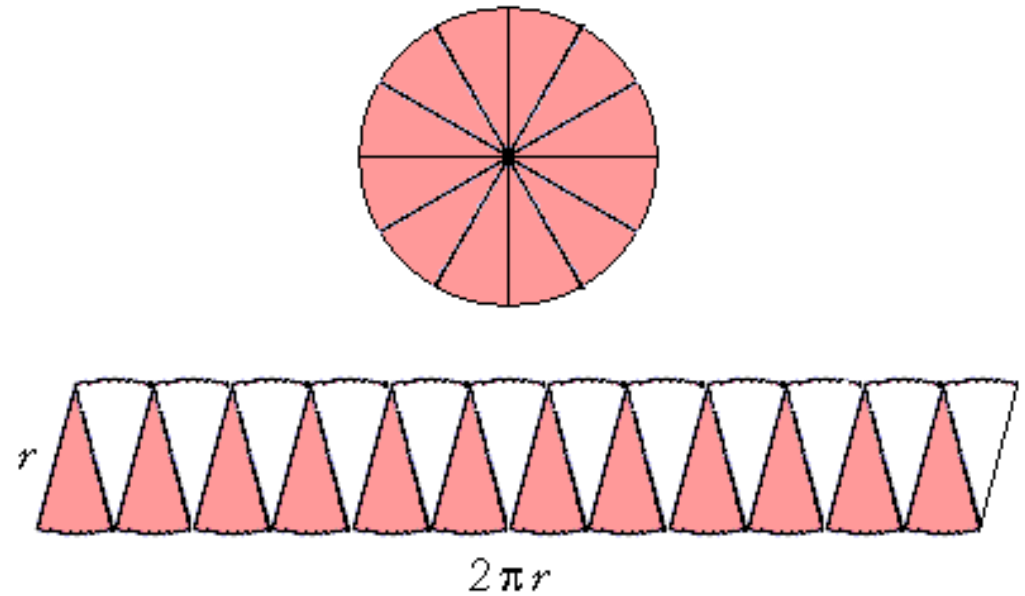
$$= \text{base} \times \text{height}$$

$$= \frac{1}{2} \times \text{circumference} \times \text{height}$$

$$= \frac{1}{2} \times 2\pi r \times r$$

$$= \pi r^2$$

Therefore, area of circle = πr^2



Area of Circles

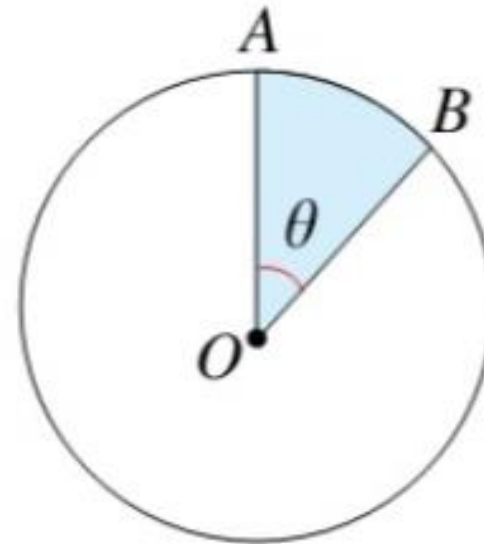
Length of arc in a Circle:

$$\text{Arc length} = \frac{\theta}{360} \times \pi \times d$$

$$\text{Arc length} = \frac{\theta}{360} \times 2 \times \pi \times r$$

θ - angle of the sector

r - radius of the circle



Area of Circles

The area of a sector is a region bounded by an arc and two radii. The area of the sector is proportional to the area of the circle.

$$\frac{\text{Area of sector}}{\text{Area of circle}} = \frac{\text{Angle at centre}}{360^\circ}$$

Therefore,

$$\frac{\text{Area of } AOB}{\pi r^2} = \frac{\theta}{360^\circ}$$

