GCSE Maths – Geometry and Measures

Properties of Circles

Notes

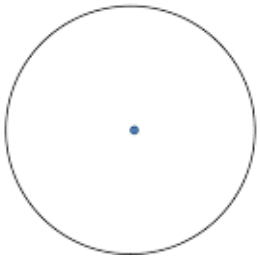
WORKSHEET

Circles

A circle is a shape that has only **1 'side'** which is called the circumference. All points on the curve are the **same distance away** from one point (the **centre**).

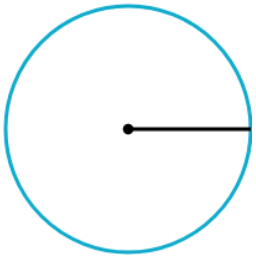
Centre

The centre of the circle is the point that is at an equal distance from all the points on the circumference of the circle.



Radius

The radius is a line that joins the centre of the circle with a point on the circumference. You can draw many radii from the centre to the circumference. Note, the plural for radius is radii.



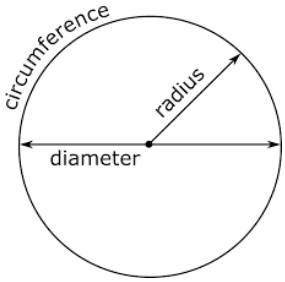
Diameter

The diameter is a line that joins a point on the circumference with another point on the circumference and passes through the centre point. It also referred to as twice the radius.

Circumference

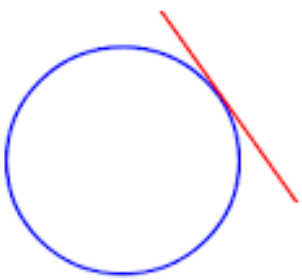
The circumference is also known as the perimeter of the circle and defines the distance around the outside of the circle. This can be calculated using this formula:

$$Circumference = \pi d = 2\pi r$$



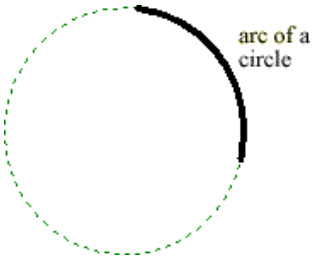
Tangent

A tangent is a line that touches the circle at **only one point**. The tangent meets the radius at a **perpendicular** angle (90°).



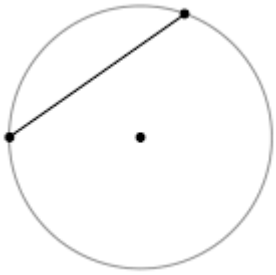
Arc

An arc is a **portion** of the circumference of the circle.



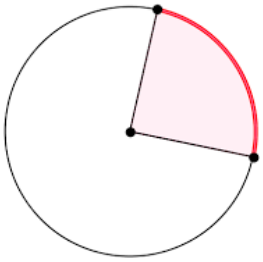
Chord

A chord is a straight line joining two points on the circumference. It does not have to pass through the centre. Note, a chord which passes through the centre is the diameter.



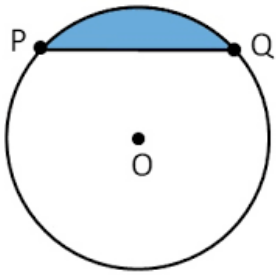
Sector

A sector of a circle is a portion of a circle and is **"pie-shaped"**. Its perimeter is made up of two radii and a portion of the circumference (arc).



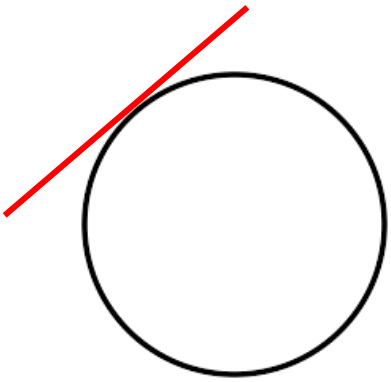
Segment

A segment of a circle is the area enclosed by **an arc and a chord** of the circle.



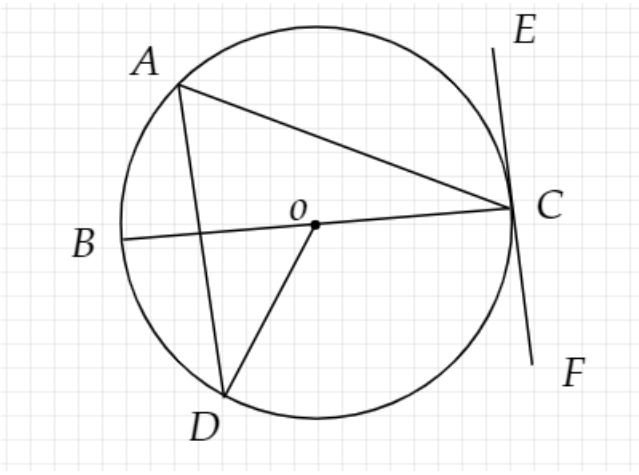
Example: Draw a tangent to a circle

A tangent is a straight line that touches the circle a one point:



Properties of Circles – Practice Questions

1. Consider the following diagram.



Define the following:

a) AC

b) AD

c) OC

d) BC

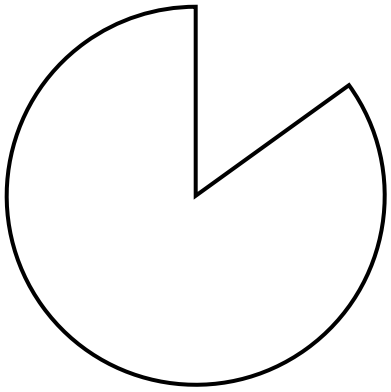
e) OD

f) EF

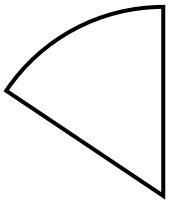
2. A circle has diameter 10 cm. Taking $\pi = 3$, find the perimeter of the circle.

3. A circle has perimeter $(3x + 21)$ cm. Taking $\pi = 3$, find the radius of the circle in terms of x.

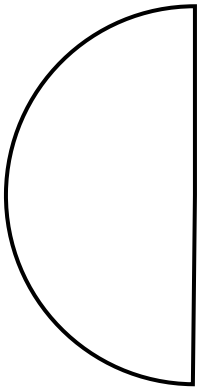
4. A sector of a circle with arc length 3 cm is cut out of the circle. If the radius is 5 cm, find the perimeter of the shape to the nearest centimetre.



5. The perimeter of a circle is 24 cm. A sector is cut out with arc length 3 cm. What is the perimeter of the sector?



6. The radius of this shape is 3 cm. What is the perimeter of the shape?



Worked solutions for the practice questions can be found amongst the worked solutions for the corresponding worksheet file.