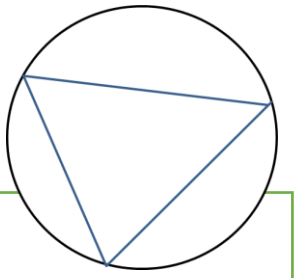
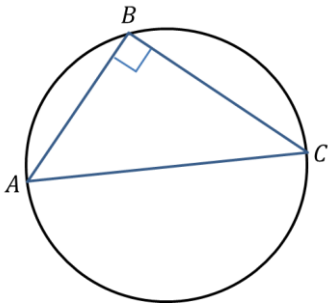
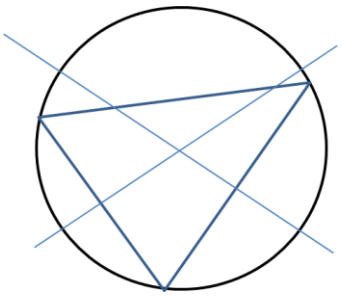
Triangles in Circles



- The triangle **inscribes** the circle.
  (A shape inscribes another if it is inside and its boundaries touch but do not intersect the outer shape)
- The circle **circumscribes** the triangle.
- If the circumscribing shape is a circle, it is known as the **circumcircle** of the triangle.
- The centre of a circumcircle is known as the **circumcentre**.





Examples

1. The points $A(-8,1),\ B(4,5), C(-4,9)$ lie on a circle.

a) Show that AB is a diameter of the circle.

2. The points $A(0,2),\ B(2,0), C(8,18)$ lie on the circumference of a circle. Determine the equation of the circle.

Extension

[STEP 2009 Q8 Edited] If equation of the circle C is $(x-2t)^2+(y-t)^2=t^2$, where t is a positive number, it can be shown that C touches the line $y=0$ as well as the line $3y=4x$.

Find the equation of the incircle of the triangle formed by the lines $y=0$, $3y=4x$ and $4y+3x=15$.

Note: The incircle of a triangle is the circle, lying totally inside the triangle, that touches all three sides.