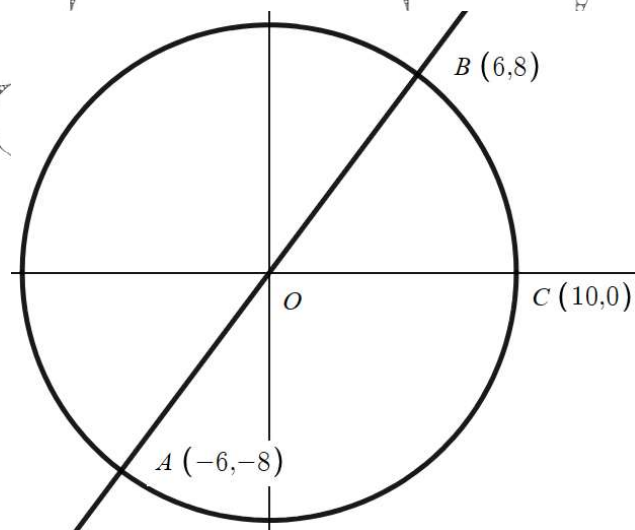


(34) Circles and Triangles

WORKING AT D/E

(1) The diagram below shows the circle with equation $x^2 + y^2 = 100$



- Verify that the point $C(10,0)$ lies on the circle.
- Write down the length of the radius of the circle.
- Prove that AB is a diameter of the circle.
- Find the size of the angle ACB in degrees.
- Given that O is the origin of the circle, find the area of the triangle OBC .
- The point D also lies on the circle. Given that the gradient of the chord AD is 0, find the coordinates of the point D .

WORKING AT B/C

- A circle with centre C has equation $(x - 3)^2 + (y - 3)^2 = 10$
 - Sketch the circle showing the coordinates of C . The line with equation $y = 4$ cuts the circle at the points A and B .
 - Find the coordinates of the points A and B .
 - Find the area of the triangle ABC .

- A circle has equation $(x - 6)^2 + (y + 1)^2 = 29$
 - Verify that the points $P(1,1)$ and $Q(4,4)$ both lie on the circle.
 - Explain why PQ is not a diameter of the circle.
 - The circle has centre C . Write down the coordinates of C .
 - Hence, show that the perimeter of the triangle PCQ can be written in the form $a\sqrt{b} + c\sqrt{d}$ where a, b, c and d are integers.
 - Show that the point $(7,5)$ lies outside the circle.

WORKING AT A*/A

(1) Points $P(4,1)$, $Q(9,6)$ and $R(6,7)$ lie on the circle C . Prove that PQ is a diameter of the circle.

- The line $x = 0$ is a tangent to the circle with equation $(x - 4)^2 + (y - 3)^2 = r^2$.
 - Write down the value of r^2 .
The circle crosses the line $y = 0$ at A and B , where $B > A$.
 - Show that the chord AB has length $2\sqrt{7}$.
Given that the centre of the circle is C find the area of the triangle ACB in the form $p\sqrt{q}$.