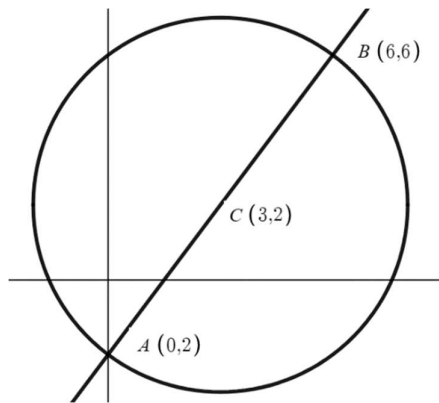


(30) Circle Geometry Midpoint & Perpendicular

WORKING AT D/E

- (1) The line AB is a diameter of a circle. The coordinates of A and B are $(6,3)$ and $(12,5)$.
- (a) Find the centre of the circle.
- (b) Find the exact length of the diameter of the circle
- (c) Hence, write down the exact length of the radius.
- (2) The centre of a circle has coordinates $(3,11)$. Point $A(2,6)$ and $B(p,q)$ both lie on the circle such that AB is a diameter of the circle. Show that the $p = 4$ and $q = 16$.
- (3) The diagram below shows a circle with centre C and diameter AB . Find the equation of the line shown perpendicular to the diameter. Give your answer in the form $ax + by = c$



WORKING AT B/C

- (1) A circle has centre C and diameter AB where the coordinates of A and B are $(-1,4)$ and $(9,4)$.
- (a) Find the centre of the circle
- (b) Hence, show that the perpendicular bisector of AB is a vertical line stating its equation.

- (2) A circle with diameter 10 has centre $(-3,6)$. The points $A(-9,2)$ and $B(3,p)$ lie on the circle. Given that AB is the diameter of the circle, find the value of p .

- (3) A circle has diameter PQ where the coordinates of P and Q are $(3,-4)$ and $(6,5)$ respectively.
- Show that the diameter of the circle perpendicular to PQ has the equation $x + 3y - 6 = 0$

WORKING AT A*/A

- (1) A circle lies in the xy plane and has centre (p,q) . The coordinate axes are tangents to the circle. The points ABD and E lie on the circle. AB is a horizontal line and a diameter of the circle. DE is a vertical line and is also a diameter of the circle. Show that the area of the quadrilateral $AEBD = p^2 + q^2$

- (2) The centre of the circle C , which lies in the xy plane, has coordinates (m,n) . One diameter of the circle lies on the line with equation $x + y = 6$. Given that the coordinate axes are tangents to the circle, show that $m = n$

- (3) A circle has centre $(0,0)$. The point $A(x,y)$ lies on the circle.
- (a) Write down **any** other point that lies on the circle on the circle in terms of x and y .
- (b) Find the exact length of the diameter of the circle in terms of x and y .