

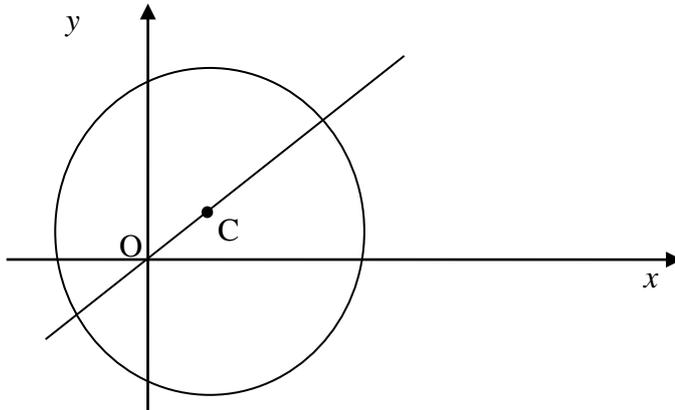
Section 2: Circles

Exercise

- Write down the equation for each of the following circles.
 - centre $(0, 0)$, radius 6
 - centre $(3, 1)$, radius 5
 - centre $(-2, 5)$, radius 1
 - centre $(0, -4)$, radius 3
- For each of these circles, write down the coordinates of the centre and the radius.
 - $x^2 + y^2 = 100$
 - $(x - 2)^2 + (y - 7)^2 = 16$
 - $(x + 3)^2 + (y - 4)^2 = 4$
 - $(x + 4)^2 + (y + 5)^2 = 20$
- Describe the transformations that map
 - the circle $x^2 + y^2 = 4$ to the circle $(x - 5)^2 + (y + 2)^2 = 4$
 - the circle $(x + 1)^2 + (y - 3)^2 = 16$ to the circle $x^2 + y^2 = 16$.
- The point C is $(4, -2)$ and the point A is $(6, 3)$.
Find the equation of the circle centre C and radius CA.
- The points A $(2, 0)$ and B $(6, 4)$ form the diameter of a circle. Find the equation of the circle.
- A circle passes through the points Q $(0, 3)$ and R $(0, 9)$ and touches the x -axis. Work out two possible equations.
- Show that the line $y = 4 - x$ is a tangent to the circle $x^2 + y^2 = 8$.
 - Show that the line $4y = 3x - 25$ is a tangent to the circle $x^2 + y^2 = 25$.
- The line $2y + x = 10$ meets the circle $x^2 + y^2 = 65$ at P and Q.
Calculate the length of PQ.
- The points P $(-2, 6)$, Q $(6, 0)$ and R $(5, 7)$ all lie on a circle.
 - Show that PR is perpendicular to QR.
 - Explain why the result from (i) shows that PQ is a diameter of the circle.
 - Hence calculate the equation of the circle.

AQA FM Coordinate geometry 2 Exercise

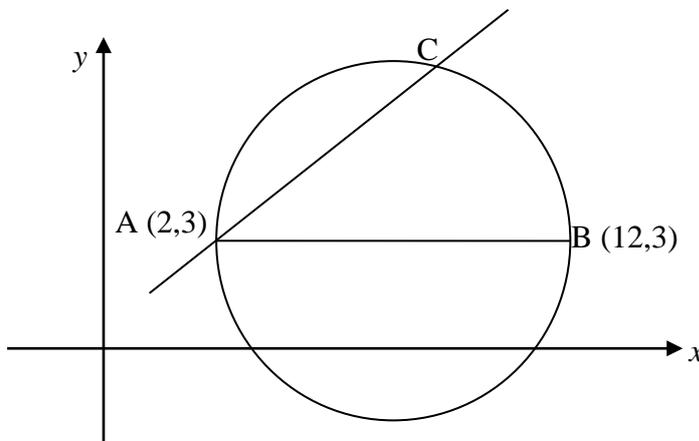
10. The diagram shows the circle with equation $(x-2)^2 + (y-2)^2 = 16$. C is the centre of the circle.



Find the equation of a circle which has the following properties.

- The circle has the same radius as the given circle.
- The centre of the circle is on the line OC.
- The circle touches the x -axis.

11. AB is a diameter of a circle. C lies on the circle. The equation of the line AC is $2y - x = 4$.



Find the coordinates of point C.

12. A circle goes through the origin O and the point A = (3, 1). The centre of the circle is on the line $y = 2$.

- Find the equation of the perpendicular bisector of OA
- Hence find the coordinates of the centre of the circle.

AQA FM Coordinate geometry 2 Exercise

13. A circle has equation $(x - 4)^2 + (y - 1)^2 = 10$. The circle goes through points $A = (1,0)$ and $B = (5,4)$.
- (i) Find the equations of the tangents to the circle at A and B
 - (ii) Find the point where the tangents at A and B intersect
14. The points $A = (-2, 2)$, $B = (6, 2)$ and $D = (0, -4)$ lie on a circle.
- (i) Find the equation of the perpendicular bisector of A and B
 - (ii) Find the equation of the perpendicular bisector of B and D
 - (iii) Determine the centre of the circle by finding where these two lines intersect
 - (iv) Work out the equation of the circle