

Circle Coordinate Geometry 1 Questions

1 Write down the equation of each circle:

- a Centre (3, 2), radius 4 b Centre (-4, 5), radius 6 c Centre (5, -6), radius $2\sqrt{3}$
d Centre $(2a, 7a)$, radius $5a$ e Centre $(-2\sqrt{2}, -3\sqrt{2})$, radius 1

2 Write down the coordinates of the centre and the radius of each circle:

- a $(x + 5)^2 + (y - 4)^2 = 9^2$ b $(x - 7)^2 + (y - 1)^2 = 16$ c $(x + 4)^2 + y^2 = 25$
d $(x + 4a)^2 + (y + a)^2 = 144a^2$ e $(x - 3\sqrt{5})^2 + (y + \sqrt{5})^2 = 27$

3 In each case, show that the circle passes through the given point:

- a $(x - 2)^2 + (y - 5)^2 = 13$, point (4, 8) b $(x + 7)^2 + (y - 2)^2 = 65$, point (0, -2)
c $x^2 + y^2 = 25^2$, point (7, -24) d $(x - 2a)^2 + (y + 5a)^2 = 20a^2$, point $(6a, -3a)$
e $(x - 3\sqrt{5})^2 + (y - \sqrt{5})^2 = (2\sqrt{10})^2$ point, $(\sqrt{5}, -\sqrt{5})$

- 4 The point (4, -2) lies on the circle centre (8, 1).
Find the equation of the circle.

Hint First find the radius of the circle.

10 Find the centre and radius of the circle with each of the following equations.

- a $x^2 + y^2 - 2x + 8y - 8 = 0$
b $x^2 + y^2 + 12x - 4y = 9$
c $x^2 + y^2 - 6y = 22x - 40$
d $x^2 + y^2 + 5x - y + 4 = 2y + 8$
e $2x^2 + 2y^2 - 6x + 5y = 2x - 3y - 3$

Hint Start by writing the equation in one of the following forms:
 $(x - a)^2 + (y - b)^2 = r^2$
 $x^2 + y^2 + 2fx + 2gy + c = 0$

Challenge

- 1 A circle with equation $(x - k)^2 + (y - 2)^2 = 50$ passes through the point (4, -5).
Find the possible values of k and the equation of each circle.
- 2 By completing the square for x and y , show that the equation $x^2 + y^2 + 2fx + 2gy + c = 0$ describes a circle with centre $(-f, -g)$ and radius $\sqrt{f^2 + g^2 - c}$.