



CAMI Mathematics: Grade 12

12.8 Analytical Geometry

12.8 Circles

1. Equation of the circle

- (a) Determine the equation of the circle with centre K(-5 ; -4) and radius 5.
- (b) Determine the coordinates of the centre A and the radius of $x^2 + (y - 1)^2 = 16$.
- (c) Determine the coordinates of the centre A and the radius of $(x + 2)^2 + (y + 1)^2 = 25$.
- (d) Determine the equation of the circle with centre B(-4 ; 3) and radius 4.
- (e) Determine the coordinates of the centre O and the radius of $x^2 + y^2 = 144$.
- (f) Determine the equation of the circle with centre (5 ; -3) through the point (3 ; 2).
- (g) Determine the equation of the circle with centre (-3 ; 3) through the point (5 ; 1).
- (h) Determine the equation of the circle with centre (2 ; -5) and radius 4.
- (i) Determine the coordinates of the centre A and the radius of $(x + 2)^2 + (y - 2)^2 = 9$.
- (j) Determine the equation of the circle with centre (-2 ; -1) through the point (5 ; 1).



MEMO

1. Equation of the circle [8.9.5.1; 8.9.5.2]

(a) Centre K(-5 ; -4) and radius 5

$$(x - a)^2 + (y - b)^2 = r^2$$

$$(x + 5)^2 + (y + 4)^2 = 25$$

(b) $x^2 + (y - 1)^2 = 16$

Centre: (0 ; 1)

Radius: 4

(c) $(x + 2)^2 + (y + 1)^2 = 25$

Centre: (-2 ; -1)

Radius: 5

(d) Centre B(-4 ; 3) and radius 4

$$(x - a)^2 + (y - b)^2 = r^2$$

$$(x + 4)^2 + (y - 3)^2 = 16$$

(e) $x^2 + y^2 = 144$

Centre: (0 ; 0)

Radius: 12

(f) Centre (5 ; -3) through the point (3 ; 2)

$$\text{Radius} = \sqrt{(3 - 5)^2 + (2 + 3)^2}$$

$$\text{Radius} = \sqrt{4 + 25}$$

$$\text{Radius} = \sqrt{29}$$

$$(x - a)^2 + (y - b)^2 = r^2$$

$$(x - 5)^2 + (y + 3)^2 = 29$$

(g) Centre (-3 ; 3) through the point (5 ; 1)

$$\text{Radius} = \sqrt{(-3 - 5)^2 + (3 - 1)^2}$$

$$\text{Radius} = \sqrt{64 + 4}$$

$$\text{Radius} = \sqrt{68}$$



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$$(x - a)^2 + (y - b)^2 = r^2$$

$$(x + 3)^2 + (y - 3)^2 = 68$$

(h) Centre (2 ; -5) and radius 4

$$(x - a)^2 + (y - b)^2 = r^2$$

$$(x - 2)^2 + (y + 5)^2 = 16$$

(i) $(x + 2)^2 + (y - 2)^2 = 9$

Centre: (-2 ; 2)

Radius: 3

(j) Centre (-2 ; -1) through the point (5 ; 1)

$$\text{Radius} = \sqrt{(-2 - 5)^2 + (-1 - 1)^2}$$

$$\text{Radius} = \sqrt{49 + 4}$$

$$\text{Radius} = \sqrt{53}$$

$$(x - a)^2 + (y - b)^2 = r^2$$

$$(x + 2)^2 + (y + 1)^2 = 53$$

