

Coordinate Geometry:Circles

Question Paper 4

Level	A Level
Subject	Maths
Exam Board	OCR
Topic	Coordinate Geometry & Graphs
Sub Topic	Coordinate Geometry: Circles
Booklet	Question Paper 4

Time Allowed: 47 minutes

Score: /39

Percentage: /100

- 1 A circle with centre C has equation $x^2 + y^2 - 8x - 2y - 3 = 0$.
- (i) Find the coordinates of C and the radius of the circle. [3]
 - (ii) Find the values of k for which the line $y = k$ is a tangent to the circle, giving your answers in simplified surd form. [3]
 - (iii) The points S and T lie on the circumference of the circle. M is the mid-point of the chord ST . Given that the length of CM is 2, calculate the length of the chord ST . [3]
 - (iv) Find the coordinates of the point where the circle meets the line $x - 2y - 12 = 0$. [6]
- 2 A circle has equation $x^2 + y^2 + 6x - 4y - 4 = 0$.
- (i) Find the centre and radius of the circle. [3]
 - (ii) Find the coordinates of the points where the circle meets the line with equation $y = 3x + 4$. [6]
- 3
- (i) Write down the equation of the circle with centre $(0, 0)$ and radius 7. [1]
 - (ii) A circle with centre $(3, 5)$ has equation $x^2 + y^2 - 6x - 10y - 30 = 0$. Find the radius of the circle. [2]
- 4 A circle has equation $x^2 + y^2 + 2x - 4y - 8 = 0$.
- (i) Find the centre and radius of the circle. [3]
 - (ii) The circle passes through the point $(-3, k)$, where $k < 0$. Find the value of k . [3]
 - (iii) Find the coordinates of the points where the circle meets the line with equation $x + y = 6$. [6]
- 5
- (i) Express $x^2 - 5x + \frac{1}{4}$ in the form $(x - a)^2 - b$. [3]
 - (ii) Find the centre and radius of the circle with equation $x^2 + y^2 - 5x + \frac{1}{4} = 0$. [3]

6 The line with equation $3x + 4y - 10 = 0$ passes through point $A (2, 1)$ and point $B (10, k)$.

(i) Find the value of k . [2]

(ii) Calculate the length of AB . [2]

A circle has equation $(x - 6)^2 + (y + 2)^2 = 25$.

(iii) Write down the coordinates of the centre and the radius of the circle. [2]

(iv) Verify that AB is a diameter of the circle. [2]

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5 (i) Express $x^2 + 3x$ in the form $(x + a)^2 + b$. [2]

(ii) Express $y^2 - 4y - \frac{11}{4}$ in the form $(y + p)^2 + q$. [2]

A circle has equation $x^2 + y^2 + 3x - 4y - \frac{11}{4} = 0$.

(iii) Write down the coordinates of the centre of the circle. [1]

(iv) Find the radius of the circle. [2]