

Equation of a Circle and Tangents

For Pearson Edexcel GCSE Mathematics (1MA1) • Higher tier

Name _____

Total marks: **26**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** The equation of a circle is $x^2 + y^2 = 20.25$
Find the radius of the circle.

.....
(1)

(Total for Question 1 is 1 mark)

- 2** The equation of a circle is $x^2 + y^2 = 64$
Write down the coordinates of the points where the circle crosses the x -axis.

.....
(1)

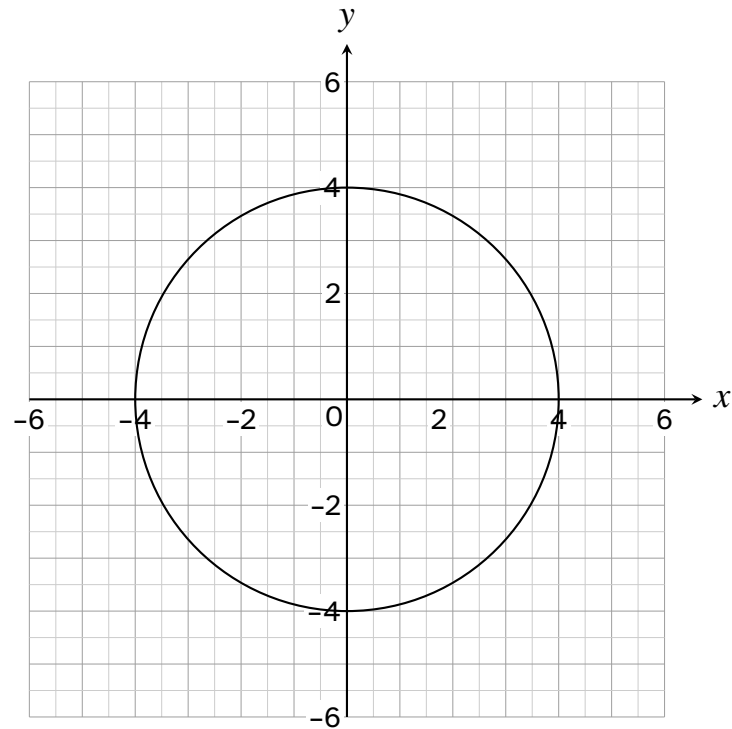
(Total for Question 2 is 1 mark)

- 3** The point $P(-2, 6)$ lies on a circle with centre the origin.
Find the equation of the circle.

.....
(2)

(Total for Question 3 is 2 marks)

- 4 The graph of a circle with centre O is drawn on the grid.



- (a) Write down an equation of the circle.

.....
(1)

- (b) By drawing a suitable straight line on the grid, find estimates for the solutions of the simultaneous equations

$$\begin{aligned}x^2 + y^2 &= 16 \\x - 2y &= 2\end{aligned}$$

.....
(3)

- (c) Explain why the simultaneous equations

$$x^2 + y^2 = 16$$

$$y = 5$$

have no solutions.

(1)

(Total for Question 4 is 5 marks)

- 5** $P(-5, 12)$ is a point on the circle $x^2 + y^2 = 169$

Find an equation of the tangent to the circle at P .

Give your answer in the form $ax + by = c$ where a , b and c are integers.

.....
(4)

(Total for Question 5 is 4 marks)

- 6** The point $P(1, 6)$ lies on the circle $x^2 + y^2 = 37$

The tangent to the circle at P passes through the point $Q(k, 5)$

Find the value of k .

You must show all your working.

$k =$
(4)

(Total for Question 6 is 4 marks)

- 7 The point $P(a, a - 1)$ lies on the circle $x^2 + y^2 = 41$, where $a > 0$
Find an equation of the tangent to the circle at P .
Give your answer in the form $px + qy = r$ where p , q and r are integers.

.....
(4)

(Total for Question 7 is 4 marks)

- 8 The line $y = x + 2$ intersects the circle $x^2 + y^2 = 34$ at two points.
Find the coordinates of the two points.

.....
(5)

(Total for Question 8 is 5 marks)
