GCSE HIGHER · REVISION MAT 1

Equation of a circle and tangents

1 Write down the radius of the circle

$$x^2 + y^2 = 49$$

2 Write down the equation of the circle with centre (0, 0) and radius 6.

3 Is (3, 4) on the circle $x^2 + y^2 = 25$?

Show how you know.

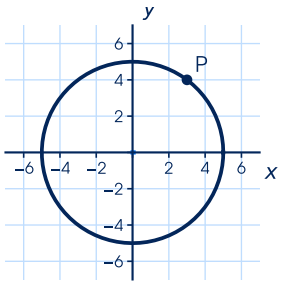
4 A circle has centre (0, 0) and passes through (5, 12).

Find its equation.

5 Show that (−6, 8) lies on $x^2 + y^2 = 100$.

Find the gradient of the radius to this point.

6 Find the equation of the tangent to $x^2 + y^2 = 25$ at (3, 4).



7 Show that the tangent to $x^2 + y^2 = 5$ at (1, 2) is

$$x + 2y = 5$$

8 The tangent to $x^2 + y^2 = 100$ at P(8, 6) meets the x-axis at Q.

Find the area of triangle OPQ.

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1 7

2 $x^2 + y^2 = 36$

3 $9 + 16 = 25$

Yes

4 $r^2 = 25 + 144$

$x^2 + y^2 = 169$

5 $36 + 64 = 100$ ✓

Gradient $\frac{8}{-6} = -\frac{4}{3}$

6 Radius gradient $\frac{4}{3}$, tangent $-\frac{3}{4}$

$4 = -\frac{9}{4} + c$

$y = -\frac{3}{4}x + \frac{25}{4}$

7 Radius gradient 2, tangent $-\frac{1}{2}$

$y - 2 = -\frac{1}{2}(x - 1)$

$2y - 4 = -x + 1$

$x + 2y = 5$

8 Tangent: $4x + 3y = 50$

Q = (12.5, 0)

Area $= \frac{1}{2} \times 12.5 \times 6 = 37.5$

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