GCSE HIGHER · REVISION MAT 5

Equation of a circle and tangents

1 Write down the equation of the circle with centre (0, 0) and radius 10.

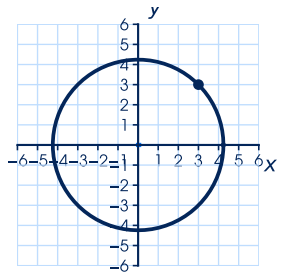
2 A circle with centre O passes through (–3, –4).

Find its radius.

3 Show that (1, 7) lies outside the circle $x^2 + y^2 = 49$.

4 The point (a, a) lies on $x^2 + y^2 = 18$.

$a > 0$. Find a.



5 Write down the equation of the tangent to $x^2 + y^2 = 25$ at (5, 0).

Explain your answer.

6 Find the equation of the tangent to $x^2 + y^2 = 20$ at (–2, –4).

7 Show that $y = 7 - x$ meets $x^2 + y^2 = 25$ at (3, 4) and (4, 3).

8 P(5, 5) lies on $x^2 + y^2 = 50$.

The tangent at P meets the y-axis at Q.

Find the area of triangle OPQ.

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Equation of a circle and tangents

1 $x^2 + y^2 = 100$

2 $\sqrt{9 + 16}$

5

3 $1 + 49 = 50 > 49$

So it is further from O than the radius.

4 $2a^2 = 18$

$a = 3$

5 The radius lies along the x-axis.

Tangent is vertical: $x = 5$

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

$-4 = 1 + c$

$y = -\frac{1}{2}x - 5$

7 $x^2 + (7 - x)^2 = 25$

$x^2 - 7x + 12 = 0$

$x = 3$ or $4 \Rightarrow (3, 4), (4, 3)$

8 Tangent gradient -1: $y = -x + 10$

$Q = (0, 10)$

Area $= \frac{1}{2} \times 10 \times 5 = 25$

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