GCSE HIGHER · REVISION MAT 4

Equation of a circle and tangents

1 Write down the centre of the circle

$$x^2 + y^2 = 30$$

2 Write the radius of $x^2 + y^2 = 12$ as a simplified surd.

3 Kim says the circle $x^2 + y^2 = 16$ has radius 16.

Is she correct?

4 A circle with centre O passes through $(-2, 5)$.

Does it pass through $(4, 3)$? Explain.

5 Show that the tangent to $x^2 + y^2 = 13$ at $(2, 3)$ has gradient $-\frac{2}{3}$.

6 The tangent to $x^2 + y^2 = 25$ at $(4, -3)$ crosses the y-axis.

Find where.

7 Find where the line $y = 2x$ meets the circle $x^2 + y^2 = 20$.

8 The line $y = 3$ cuts the circle $x^2 + y^2 = 25$ at A and B.

Find AB and the area of triangle OAB.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 4

Equation of a circle and tangents

1 **(0, 0)**

2 $\sqrt{12}$

$2\sqrt{3}$

3 $r^2 = 16$

No, the radius is 4.

4 $r^2 = 4 + 25 = 29$

$16 + 9 = 25 \neq 29$

No

5 Radius gradient $\frac{3}{2}$

Tangent gradient $-\frac{2}{3}$ (product -1)

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

$-3 = \frac{16}{3} + c$

$(0, -\frac{25}{3})$

7 $5x^2 = 20$

(2, 4) and (–2, –4)

8 $x^2 = 16 \Rightarrow x = \pm 4$

AB = 8

Area = $\frac{1}{2} \times 8 \times 3 = 12$

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