



Air maths tuition

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Equation of a Tangent to a Circle

Find the equation of the tangent to the circle $x^2 + y^2 + 4x - 8y - 5 = 0$ at the point $P(-5, 8)$.
Give your answer in the form $ax + by + c = 0$
where a , b and c are integers.

$$\therefore x^2 + 4x + y^2 - 8y - 5 = 0$$

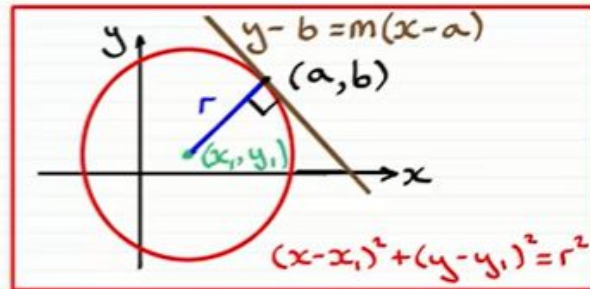
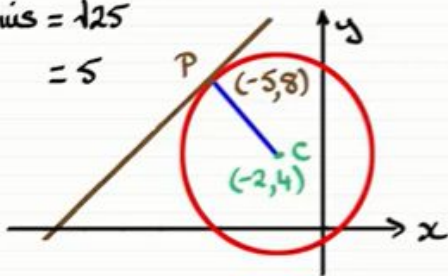
$$\therefore (x+2)^2 - 4 + (y-4)^2 - 16 - 5 = 0$$

$$\therefore (x+2)^2 + (y-4)^2 = 25$$

\therefore centre $(-2, 4)$,

$$\text{radius} = \sqrt{25}$$

$$= 5$$



$$\therefore \text{Gradient of } CP = \frac{8-4}{-5-(-2)} = -\frac{4}{3}$$

$$\therefore \text{Gradient of the tangent at } P = \frac{3}{4}$$

\therefore Equation of the tangent at P is :-

$$y - 8 = \frac{3}{4}(x - (-5))$$

$$\therefore 4y - 32 = 3x + 15$$

$$\therefore 3x - 4y + 47 = 0$$

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