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Circle | Past Paper Question | C1 OCR June 2012 Q10(iv)

A circle has equation $(x - 5)^2 + (y + 2)^2 = 25$. ①

Determine algebraically whether the line with equation $y = 2x$ meets the circle.

$$y = 2x \quad \text{②}$$

Sub ② into ①

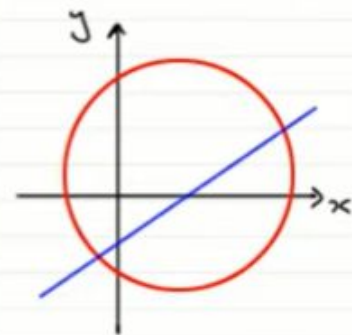
$$\therefore (x - 5)^2 + (2x + 2)^2 = 25$$

$$\therefore x^2 - 10x + 25 + 4x^2 + 8x + 4 = 25$$

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

$$\begin{aligned} \text{discriminant} &= (-2)^2 - 4(5)(4) \\ &= -76 \\ &< 0 \end{aligned}$$

\therefore no roots \Rightarrow line $y = 2x$ does not intersect



$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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