

## SAMPLE PAPER 4: PAPER 2

### QUESTION 1 (25 MARKS)

#### Question 1 (a)

Centre  $(1, 2)$ ,  $r = 5$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x-1)^2 + (y-2)^2 = 5^2$$

$$(x-1)^2 + (y-2)^2 = 25$$

#### Question 1 (b)

$$y = 0 : (x-1)^2 + (0-2)^2 = 25$$

Cuts the  $x$ -axis: Put  $y = 0$

$$(x-1)^2 + 4 = 25$$

$$(x-1)^2 = 21$$

$$(x-1) = \pm\sqrt{21}$$

$$x = 1 \pm \sqrt{21}$$

$$\therefore P(1 + \sqrt{21}, 0), Q(1 - \sqrt{21}, 0)$$

#### Question 1 (c)

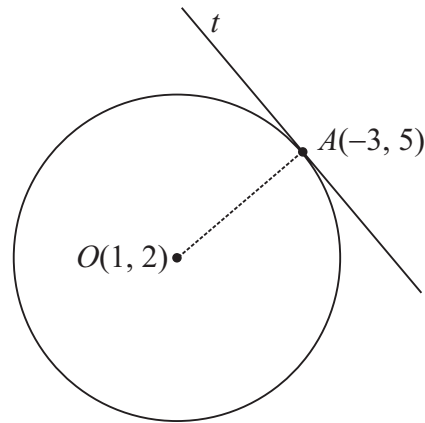
Is  $A(-3, 5) \in (x-1)^2 + (y-2)^2 = 25$ ?

$$(-3-1)^2 + (5-2)^2 = (-4)^2 + (3)^2 = 16 + 9 = 25$$

Find the slope  $m_1$  of  $OA$ :

$$m_1 = \frac{5-2}{-3-1} = \frac{3}{-4} = -\frac{3}{4}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$



Slope of tangent  $t$ :  $m_2 = \frac{4}{3}$

Perpendicular lines:  $m_1 \times m_2 = -1$

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

$$y - y_1 = m(x - x_1)$$

$$3(y - 5) = 4(x + 3)$$

$$3y - 15 = 4x + 12$$

$$0 = 4x - 3y + 27$$


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