

## SAMPLE PAPER 6: PAPER 2

### QUESTION 2 (25 MARKS)

#### Question 2 (a)

$$s: x^2 + y^2 + 2x - 8y - 8 = 0$$

$$\text{Centre } O(-1, 4), r = \sqrt{(-1)^2 + 4^2 + 8} = \sqrt{25} = 5$$

$$\text{Equation of tangents: } 4x - 3y + k = 0$$

$$\frac{|4(-1) - 3(4) + k|}{\sqrt{4^2 + (-3)^2}} = 5 \quad \boxed{d = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}}$$

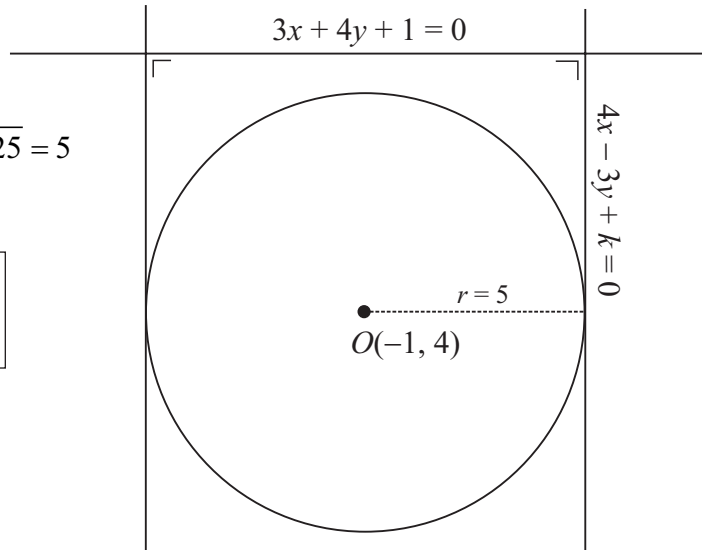
$$\frac{|-4 - 12 + k|}{\sqrt{25}} = 5$$

$$|-16 + k| = 25$$

$$-16 + k = \pm 25$$

$$\therefore k = -9, 41$$

$$t_1: 4x - 3y + 41 = 0, t_2: 4x - 3y - 9 = 0$$



#### Question 2 (b)

The length of a side of the square is 10 units. A line parallel to  $3x + 4y + 1 = 0$  has the form  $3x + 4y + k = 0$ .

Pick a point on the line  $3x + 4y + 1 = 0$ .

$(1, -1)$  is on this line.

$$\boxed{d = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}}$$

$$d = 10, (x_1, y_1) = (1, -1)$$

$$10 = \frac{|3(1) + 4(-1) + k|}{\sqrt{3^2 + 4^2}}$$

$$10 = \frac{|3 - 4 + k|}{5}$$

$$50 = |k - 1|$$

$$\pm 50 = k - 1$$

$$\therefore k = -49, 51$$

$$\text{Equations: } 3x + 4y - 49 = 0, 3x + 4y + 51 = 0$$

