

SAMPLE PAPER 4: PAPER 1

QUESTION 1 (25 MARKS)

Question 1 (a) (i)

$$p = -3, q = -5$$

$$p + q = -3 - 5 = -8$$

$$pq = (-3)(-5) = 15$$

Question 1 (a) (ii)

$$\text{Roots: } x = p, x = q$$

$$\therefore (x - p)(x - q) = 0$$

$$x^2 - px - qx + pq = 0$$

$$x^2 - (p + q)x + pq = 0$$

$$x^2 - (-8)x + 15 = 0$$

$$\therefore x^2 + 8x + 15 = 0$$

Question 1 (b)

$$l: 3x + y = 25 \Rightarrow y = 25 - 3x$$

$$s: x^2 + y^2 = 65$$

$$\therefore x^2 + (25 - 3x)^2 = 65$$

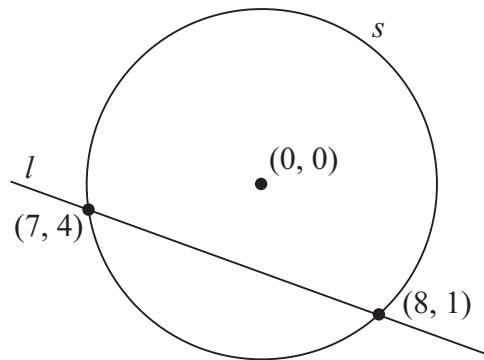
$$x^2 + 625 - 150x + 9x^2 - 65 = 0$$

$$10x^2 - 150x + 560 = 0$$

$$x^2 - 15x + 56 = 0$$

$$(x - 7)(x - 8) = 0$$

$$\therefore x = 7, 8$$



$$x = 7: y = 25 - 3(7) = 25 - 21 = 4$$

$$x = 8: y = 25 - 3(8) = 25 - 24 = 1$$

$\therefore (7, 4)$ and $(8, 1)$ are the points of intersection.

The line cuts the circle at two points whose centre is $(0, 0)$. Therefore the line l is a chord.
