

SAMPLE PAPER 5: PAPER 1

QUESTION 2 (25 MARKS)

Question 2 (a)

$$x^2 - 2 = 2y^2$$

$$3x = y + 7 \Rightarrow y = 3x - 7$$

$$x^2 - 2 = 2(3x - 7)^2 \text{ [Replace } y \text{ in the quadratic equation.]}$$

$$x^2 - 2 = 2(9x^2 - 42x + 49)$$

$$x^2 - 2 = 18x^2 - 84x + 98$$

$$0 = 17x^2 - 84x + 100$$

$$0 = (17x - 50)(x - 2)$$

$$\therefore x = 2, \frac{50}{17}$$

$$x = 2 : y = 3(2) - 7 = 6 - 7 = -1$$

$$x = \frac{50}{17} : y = 3\left(\frac{50}{17}\right) - 7 = \frac{150}{17} - 7 = \frac{31}{17}$$

$$\text{Ans: } (2, -1), \left(\frac{50}{17}, \frac{31}{17}\right)$$

Question 2 (b)

$$x^3 - kx^2 - 22x + 56 = (x + 4)(x^2 + ax + 14) \text{ [A cubic is equal to a linear by a quadratic.]}$$

$$x^3 - kx^2 - 22x + 56 = x^3 + (a + 4)x^2 + (4a + 14)x + 56$$

$$\therefore -22 = 4a + 14 \Rightarrow 4a = -36 \Rightarrow a = -9$$

$$\therefore -k = a + 4 \Rightarrow -k = -9 + 4 = -5 \Rightarrow k = 5$$

$$x^3 - 5x^2 - 22x + 56 = (x + 4)(x^2 - 9x + 14) = 0$$

$$(x + 4)(x - 2)(x - 7) = 0$$

$$\therefore x = -4, 2, 7$$
