

$$\frac{-A}{Fa} = v \rightarrow \frac{-b^2 + (5)(-1)(3)}{-1} \rightarrow -b^2 - 15 = -18 \Rightarrow -b^2 + 14 = 0$$

$$b^2 = 14 \Rightarrow b = \pm \sqrt{14}$$

$$y = -x^2 - 5x + 3 \rightarrow b^2 - 4ac = 14 - (5)(-1)(3) = 14 + 15 = 29 > 0$$

$$y = -x^2 + 5x + 3 \rightarrow b^2 - 4ac = 14 - (5)(-1)(3) = 14 + 15 = 29 > 0$$

$$\text{الف } f(x) = x^2 + 2x^2 + 4 \rightarrow t = x^2 \Rightarrow t^2 + 2t + 4 = 0 \rightarrow \Delta < 0$$

$$\text{ب } f(x) = (x-x^2)^2 - 2(x-x^2) - 15 \rightarrow x-x^2 = t \Rightarrow t^2 - 2t - 15 = 0$$

$$(t-5)(t+3) \rightarrow t = 5, -3$$

$$x-x^2 = 5 \Rightarrow x^2 = -1 \quad \text{U.O.E}$$

$$x-x^2 = -3 \Rightarrow x^2 = 4 \Rightarrow x = \pm \sqrt{4}$$

$$fx^2 - 1/x + m = 0 \quad \alpha + \beta = \frac{1}{f} = 1 \Rightarrow \alpha + \alpha + 1 = 1 \Rightarrow 2\alpha = 0 \Rightarrow \alpha = 0$$

$$\alpha + \beta = 1$$

$$\alpha \beta = \frac{m}{f} \Rightarrow 1 = \frac{m}{f} \Rightarrow m = 1$$

$$\beta = 1$$

$$x^2 - 1/x + 1 = 0 \quad \Delta > 0 \quad \checkmark$$

$$fx^2 - 4x + m - 1 = 0$$

$$\alpha + \beta = \frac{4}{f} \Rightarrow \alpha + \beta = 4 \Rightarrow \alpha = 4 - \beta$$

$$4\alpha - \beta = 1 \Rightarrow 4(4 - \beta) - \beta = 1 \Rightarrow 16 - 4\beta - \beta = 1 \Rightarrow 15 = 5\beta \Rightarrow \beta = 3$$

$$\alpha = 1$$

$$\beta = 3 \Rightarrow \alpha = 1$$

$$\alpha \beta = \frac{m-1}{f} = 0 \Rightarrow m-1 = 0 \Rightarrow m = 1$$

$$x^2 - 4x + 1 = 0 \quad \Delta > 0 \quad \checkmark$$

$$-mx^2 + 5x + 4x^2 - 1 = 0 \Rightarrow \alpha, \beta = \frac{1}{f}, \beta = 1 \Rightarrow \frac{m^2 - 1}{m} = 1 \Rightarrow m^2 - 1 = m \Rightarrow m^2 + m - 1 = 0$$

$$\alpha = \frac{1}{f}$$

$$\Delta = b^2 - 4ac = 1 - 4(-1)(-1) = 1 - 4 = -3 < 0 \quad \text{U.O.E}$$

$$m = -1 \rightarrow (-1)^2 - 1(-1) + 1 = 1 + 1 + 1 = 3 > 0 \quad \text{U.O.E}$$

$$m = 1 \rightarrow 1 - 1 + 1 = 1 > 0 \quad \text{U.O.E}$$

$$m = 1$$

$$x^2 - mx + 4 = 0 \Rightarrow \alpha \beta = 4 \Rightarrow \alpha = \frac{4}{\beta}$$

$$\alpha \beta = 1 \Rightarrow \frac{4}{\beta} \beta = 1 \Rightarrow 4 = 1 \Rightarrow \beta = 4, \alpha = \frac{1}{4}$$

$$\alpha + \beta = m \Rightarrow \frac{1}{4} + 4 = m \Rightarrow m = \frac{17}{4}$$

$$x^2 - \frac{17}{4}x + 4 = 0 \quad \Delta > 0 \quad \checkmark$$

$$\alpha \cdot \beta$$

$$\Rightarrow \alpha + \beta = 1 \rightarrow \beta + \beta = 1 \Rightarrow \beta = 1 \Rightarrow \alpha + \beta = m$$

$$\alpha = 1 \quad \beta + 1 = m \Rightarrow m = 2$$

$$x^2 - 1x + 1 \rightarrow \Delta < 0 \checkmark$$

$$x^2 - 1x + 1 = 0 \rightarrow x^2 - 1x + 1 = 0 \Rightarrow \alpha + 1 + \frac{1}{\alpha} = 0 \Rightarrow \alpha + \frac{1}{\alpha} = -1$$

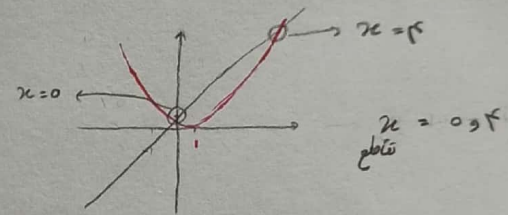
$$\alpha^3 + \frac{1}{\alpha^3} = \left(\alpha + \frac{1}{\alpha} \right)^3 - \left(3\alpha + \frac{3}{\alpha} \right) = (-1)^3 - (3\alpha + \frac{3}{\alpha}) = -1 - 3(-1) = 2$$

$$h_{max} = \frac{-\Delta}{4a} = \frac{-(\omega_0)^2 + (1)(-1)(-1)}{-1} = \frac{-1}{-1} = 1 \text{ m}$$

$$-10t^2 + \omega_0 t = 0 \Rightarrow t(-10t + \omega_0) = 0 \rightarrow t = 0.5 \text{ s} \checkmark$$

$$a) (x-1)^2 = 1x + 1 \Rightarrow x^2 - 2x + 1 = 1x + 1$$

$$x^2 - 3x = 0 \rightarrow x(x-3) = 0 \rightarrow x = 3, 0$$



$$b) x^2 + 1x = |x + 1|$$

$$x(x+1) = 0 \rightarrow x = 0, -1$$

$$x = \frac{-b}{a} = \frac{-1}{1} = -1$$

$$\Rightarrow x > -1 \rightarrow x+1 = x^2 + 1x \Rightarrow x^2 + x - 1 = 0 \rightarrow x = \frac{-1 \pm \sqrt{5}}{2}$$

$$x < -1 \rightarrow -x-1 = x^2 + 1x \Rightarrow x^2 + 2x + 1 = 0 \rightarrow x = -1, -2$$

$$x = -1, -2$$

