

$$y = -x^2 + bx + 1 \quad y_s = V$$

$$y_s = \frac{-\Delta}{fa} = \frac{-(b^2 - 4ac)}{4a} = \frac{-(b^2 - 4(-1)(1))}{4} = \frac{b^2 + 4}{4} = V \rightarrow b^2 + 4 = 28 \rightarrow b^2 = 24 \rightarrow b = \pm \sqrt{24}$$

1) $f(x) = x^2 + 2x + 1 \rightarrow x^2 = t \Rightarrow t^2 + 2t + 1 = 0 \rightarrow \Delta = -4 < 0$

2) $(t - x^2)^2 - 2(t - x^2) - 1 = 0 \xrightarrow{t - x^2 = t} t^2 - 2t - 1 = 0 \rightarrow (t - 0)(t + 2) = 0$

$\begin{cases} t = 0 \rightarrow t - x^2 = 0 \rightarrow x^2 = -1 \quad X \\ t = -2 \rightarrow t - x^2 = -2 \rightarrow x^2 = 2 \rightarrow x = \pm \sqrt{2} \end{cases}$

$$x^2 - 4x + m = 0 \quad \alpha = \beta + 2$$

$$\alpha + \beta = -\frac{b}{a} = 4 \Rightarrow \beta + 2 + \beta = 4 \rightarrow 2\beta = 2 \rightarrow \beta = 1, \alpha = 3$$

$$\alpha \cdot \beta = \frac{c}{a} = \frac{m}{1} \rightarrow 3 = \frac{m}{1} \rightarrow m = 12 \quad \text{Check: } x^2 - 4x + 12 = 0 \quad \Delta < 0 \quad \checkmark$$

$$x^2 - 4x + m - 1 = 0 \quad 2\alpha - \beta = 4 \rightarrow \beta = 2\alpha - 4$$

$$\alpha + \beta = \frac{4}{1} = 4 \rightarrow \alpha + (2\alpha - 4) = 4 \rightarrow 3\alpha = 8 \rightarrow \alpha = \frac{8}{3}, \beta = 0$$

$$\alpha \cdot \beta = \frac{m-1}{1} \rightarrow m-1 = 0 \rightarrow m = 1 \quad \text{Check: } x^2 - 4x + 0 = 0 \quad \Delta > 0 \quad \checkmark$$

$$-mx^2 + 4x + m^2 - 2 = 0 \rightarrow \frac{c}{a} = 1 \rightarrow \frac{m^2 - 2}{-1} = 1 \rightarrow m^2 - 2 = -1 \rightarrow m^2 + m - 2 = 0$$

$$(m+2)(m-1) = 0 \rightarrow \begin{cases} m = -2 \rightarrow 2x^2 + 4x + 1 = 0 \rightarrow \Delta = 0 \\ m = 1 \rightarrow -x^2 + 4x - 1 = 0 \rightarrow \Delta = 12 > 0 \end{cases}$$

$$x^2 - mx + 1 = 0 \rightarrow \alpha\beta = 1 \rightarrow \alpha\beta \cdot \beta = 1 \rightarrow 2\beta = 1 \rightarrow \beta = \frac{1}{2}$$

$$\alpha \cdot \beta = \frac{c}{a} = 1 \Rightarrow \alpha \left(\frac{1}{2}\right) = 1 \rightarrow \alpha = 2$$

$$\alpha + \beta = m \Rightarrow 2 + \frac{1}{2} = \frac{4+1}{2} = \frac{5}{2} \quad \text{Check: } x^2 - \frac{5}{2}x + 1 = 0 \quad \Delta > 0 \quad \checkmark$$

$$x^2 - 4x + m = 0 \rightarrow \alpha = 2\beta$$

$$S = 4 \Rightarrow \alpha + \beta = 2\beta + \beta = 4 \rightarrow 3\beta = 4 \rightarrow \beta = \frac{4}{3}, \alpha = \frac{8}{3}$$

$$P = m = \alpha \cdot \beta = \frac{8}{3} \times \frac{4}{3} = \frac{32}{9} \quad \text{Check: } x^2 - 4x + \frac{32}{9} = 0 \quad \Delta < 0 \quad \checkmark$$

$$x^2 - 4x + 1 = 0 \quad \alpha^2 + \frac{1}{\alpha^2} = \alpha^2 + \left(\frac{1}{\alpha}\right)^2 = \left(\alpha + \frac{1}{\alpha}\right)^2 - 2\alpha \cdot \frac{1}{\alpha} = \left(\alpha + \frac{1}{\alpha}\right)^2 - 2$$

$$\alpha + \beta = -\frac{b}{a} = 4$$

$$\alpha \cdot \beta = \frac{c}{a} = 1$$

$$= \sqrt{4^2 - 4 \times 1} = \sqrt{12} = 2\sqrt{3}$$

$$h(t) = -10t^2 + \omega \cdot t$$

$$y_s = ?$$

$$h(t) = 0$$

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$$x_s = \frac{-b}{2a} = \frac{\omega}{2} \quad y_s = -10 \left(\frac{\omega}{2} \right)^2 + \omega \left(\frac{\omega}{2} \right) = -10 \times \frac{\omega^2}{4} + \frac{\omega^2}{2} = \frac{\omega^2}{4}$$

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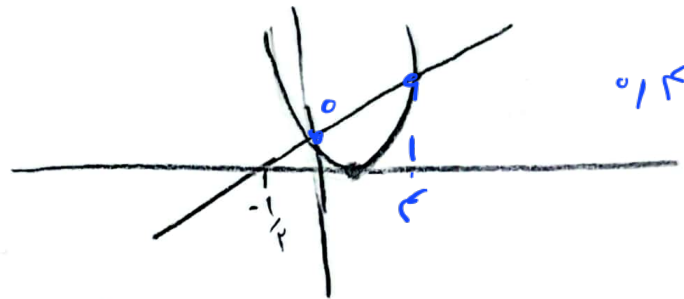
$$-10t^2 + \omega t = 0 \rightarrow -10t(t - \omega) = 0 \rightarrow \begin{cases} t = 0 \text{ X} \\ t = \omega \text{ ✓} \end{cases}$$

$$\frac{-\Delta}{2a} = \frac{\omega^2}{4}$$

الف) $(x-1)^2 = 2x+1$

$$f_1 = 2x+1$$

$$f_2 = (x-1)^2$$



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ب) $x^2 + 2x = |x+2|$

$$f_1 = x^2 + 2x$$

$$f_2 = |x+2|$$

