

$$y_{max} = \frac{-\Delta}{\epsilon a} \pm \frac{\epsilon ac - b^2}{\epsilon a} \pm \sqrt{\epsilon ac - b^2} \rightarrow \epsilon ac - b^2 \geq 0 \Rightarrow -12 - b^2 \geq 0$$

$$b^2 \leq 14, b \leq \sqrt{14} \approx 3.74$$

۱

تابع صفربدار: $t^2 + 2t + 3 \rightarrow \Delta < 0$, $x^2 = t$, $f(x) \leq 0$ (الف)

$$\text{ب) } f - x^2 \leq t \rightarrow t^2 - 2t - 1 \leq 0 \rightarrow \Delta = 4 + 4 = 8, t = \frac{2 \pm \sqrt{8}}{2} \Rightarrow t = 1 \pm \sqrt{2}$$

$$f - x^2 \leq 0 \rightarrow x^2 \leq 1 \Rightarrow x = \pm 1, f - x^2 = -3 \rightarrow x^2 = 3, x = \pm \sqrt{3}, x_1 = -\sqrt{3}$$

۲

$$x_2 = x_1 + 2 \rightarrow S = x_1 + x_1 + 2 = 2x_1 + 2 \rightarrow S = \frac{-b}{a} \pm \frac{\sqrt{b^2 - 4ac}}{a} \Rightarrow 2x_1 + 2 = \frac{-1}{2} \pm \frac{\sqrt{1 - 4 \cdot 2 \cdot 2}}{2}$$

$$p = \frac{c}{a} \pm \frac{m}{a} \pm \sqrt{\frac{m^2}{a^2}} \Rightarrow \frac{m}{a} \pm \sqrt{\frac{m^2}{a^2}}, m \leq 12$$

۳

$$\beta = 2\alpha - 4 \rightarrow S = \alpha + 2\alpha - 4 = \frac{-b}{a} \pm \sqrt{\frac{b^2 - 4ac}{a^2}} \Rightarrow 3\alpha = 4, \alpha = \frac{4}{3} \rightarrow \beta = 2(\frac{4}{3}) - 4 = -\frac{4}{3}$$

$$p = \frac{c}{a} \pm \frac{m-1}{a} \Rightarrow m \geq 1$$

۴

$$x_2 = \frac{1}{x_1} \rightarrow \frac{c}{a} \leq 1, \frac{m^2}{-m} \leq 1 \rightarrow m^2 - m - m^2 = 0, m^2 + m - m^2 = 0, \Delta = 1 + 4 = 5, m = \frac{-1 \pm \sqrt{5}}{2} \rightarrow m \leq -\frac{1}{2}, 1$$

$$\text{if } m = -\frac{1}{2} \rightarrow 2x^2 + 4x + 1 = 0, \Delta = 16 - 4 = 12, x = \frac{-4 \pm \sqrt{12}}{2} = -2 \pm \sqrt{3} \Rightarrow x = -2 + \sqrt{3} \quad \times$$

$$\text{if } m = 1 \rightarrow -x^2 + 4x - 1 = 0, \Delta = 16 - 4 = 12, x = \frac{4 \pm \sqrt{12}}{2} = 2 \pm \sqrt{3}, x_1 = \frac{2 + \sqrt{3}}{2}, x_2 = \frac{2 - \sqrt{3}}{2} \Rightarrow x_1 \times x_2 = 1 \quad \checkmark$$

۵

$$\alpha_s \frac{\kappa}{\beta^v} \rightarrow p_s \beta_x \frac{\kappa}{\beta^v} = \frac{\kappa}{\beta} s^w \Rightarrow \beta^s \frac{\kappa}{v}, \alpha_s \frac{\kappa}{1^v} s \frac{q}{r}$$

$$S = \alpha + \beta S \quad \frac{q}{r} + \frac{r}{r} = \frac{vV + 14}{14} \leq \frac{rV}{14} \Rightarrow m = + \frac{rV}{14}$$

٤

$$M_4 = M_1$$

$$S_5 \quad \psi_{n+1} + x_1 = \begin{cases} x_1 = -\frac{b}{a}, & (x_1, t \in S) \wedge n=1, \\ x_1 \in \psi \end{cases}$$

$$p_s \frac{m}{1} s w \Rightarrow m s w$$

Y

$$\alpha^V - V\alpha + \beta = 0 \rightarrow \alpha\beta = \gamma, \quad \alpha + \beta = V \rightarrow \alpha = \frac{\gamma}{\beta} \rightarrow \frac{1}{\alpha} = \frac{\beta}{\gamma}, \quad \frac{1}{\alpha^V} = \frac{\beta^W}{\gamma} \Rightarrow \frac{1}{\alpha^W} = \beta^W$$

$$\frac{1}{\alpha^W} + \alpha^W = \beta^W + \alpha^W \leq \gamma - \psi \leq \gamma - \psi(V) = \psi(V) - \psi(V) = 0$$

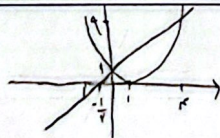
人

$$h(t) = -10t^2 + 400t \rightarrow h_{\max}, t_{\max} = \frac{-b}{2a} = \frac{-400}{-20} = 20 \text{ s} \quad \text{and} \quad h_{\max} = -10(20)^2 + 400(20) = 4000$$

نشان می دهیم $\rightarrow h(t) \leq 0 \rightarrow -10t^2 + \omega_0 t \leq 0, \quad t(-10t + \omega_0) \leq 0 \Rightarrow t \leq \omega_0$

9

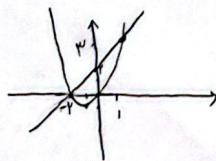
الف) $(x-1)^2 = 2x+1 \rightarrow$  $\Rightarrow x \leq 0, 2$



c) $x^2 + y^2 = |x + y| \rightarrow$



$\Rightarrow x = -y, 1$



$$x + y > 0 \rightarrow x^y + yx = x + y$$

$$(x+4)(x-1) \leq 0 \rightarrow x = -4, 1 \checkmark$$

$$x+y < 0 \rightarrow x+y \leq -x-y \rightarrow x+y \leq 0$$

$$\begin{aligned} x = -1, -2 &\rightarrow x = -1 \leftarrow 2x \\ x = -2 \leftarrow 2x &\} \text{J.J.E.} \end{aligned}$$

1.