

$$y = -x^2 + bx + c, \text{ max } = 5, b = ?$$

سوال ۳

$$y_s = \frac{-b}{2a} = \frac{-(b^2 + 14)}{-2} = 5 \rightarrow b^2 + 14 = 20 \rightarrow b^2 = 6 \rightarrow b = \pm \sqrt{6}$$

$$\text{الف) } f(x) = x^2 + 2x + 3$$

سوال ۴

$$t = x^2 \rightarrow t^2 + 2t + 3 = 0$$

$$\Delta = b^2 - 4ac \rightarrow 4 - 12 < 0 \quad / \quad \text{جواب حقیقی ندارد}$$

$$\text{ب) } f(x) = (x - x^2)^2 - 2(x - x^2) - 1$$

$$x - x^2 = t \rightarrow t^2 - 2t - 1 = 0$$

$$(t - \omega)(t + 3) = 0$$

$$t = \omega \rightarrow x - x^2 = \omega \rightarrow x^2 = -1 \quad \text{غیر ممکن}$$

$$t = -3 \rightarrow x - x^2 = -3 \rightarrow x^2 = 3 \rightarrow x = \pm \sqrt{3}$$

$$4x^2 - 14x + m = 0$$

سوال ۵

$$\text{ریشه ها} \rightarrow \alpha, \beta$$

$$S = \frac{-b}{a} \rightarrow 4(\alpha + \beta) = \frac{14}{4} = 3.5 \rightarrow \alpha + \beta = 0.875$$

$$P = \frac{c}{a} \rightarrow \frac{m}{4} = 1 \times 3.5 \rightarrow m = 14$$

$$4x^2 - 14x + m - 1 = 0$$

$$4\alpha - \beta = 4$$

سوال ۶

$$4\alpha - \beta = 4 \rightarrow 4\alpha + 4\beta - 5\beta = 4 \quad S = \frac{-b}{2a} = 2 = \alpha + \beta$$

$$4(\alpha + \beta) - 5\beta = 4$$

$$4 - 4\beta = 4 \rightarrow \beta = 0$$

$$\alpha + \beta = 2 \rightarrow \alpha = 2$$

$$P = \frac{c}{a} = \alpha\beta \rightarrow \frac{m-1}{4} = 2 \times 0 \rightarrow m-1 = 0 \rightarrow m = 1$$

$$-mx^2 + 4x + m - 2 = 0$$

سوال ۷

$$\begin{cases} P = 1 \rightarrow \frac{c}{a} = 1 \rightarrow \frac{m-2}{-m} = 1 \rightarrow m^2 + m - 2 = 0 \\ \Delta > 0 \end{cases} \quad (m+2)(m-1) = 0$$

$$m = 1$$

$$-x^2 + 4x - 1 = 0 \quad \Delta = 16 - 4 = 12 > 0$$

$$m = -2$$

$$-x^2 + 4x + 2 = 0 \quad \Delta = 16 - 16 = 0$$

$$x^2 - mx + 4 = 0$$

$$\alpha\beta = 4$$

سوال ۸

$$P = \alpha\beta = \frac{c}{a} = 4$$

$$\alpha\beta = 4 \rightarrow (\alpha/\beta) \times \beta = 4 \rightarrow 4 \times \beta = 4 \rightarrow \beta = 1$$

$$\alpha \times \frac{4}{\beta} = 4 \rightarrow \alpha = 1$$

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

$$\frac{1}{4} + \frac{1}{4} = m \rightarrow m = \frac{1}{2}$$

$$x^2 - 8x + m = 0$$

$$\left(\frac{b}{a}\right) \rightarrow \alpha, \beta = \frac{b}{a}$$

$$S = \alpha + \beta = \frac{-b}{a} \rightarrow \frac{-b}{a} = 8 \rightarrow \alpha = 1, \beta = 7 \Rightarrow \alpha = 1, \beta = 7$$

$$P = \frac{c}{a} = d/\beta \rightarrow \boxed{P = 7}$$

$$x^2 - vx + y = 0 \quad \alpha^2 + \frac{1}{\alpha^2} = 2 \quad ; \quad x^2 - vx + y = 0 \rightarrow x^2 + y = vx$$

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

$$\alpha + \frac{1}{\alpha} = \frac{\alpha^2 + 1}{\alpha} = \frac{v\alpha}{\alpha} = v$$

$$\alpha^2 + \frac{1}{\alpha^2} = \frac{\alpha^2 + 1}{\alpha^2} = \frac{(\alpha^2 + 1)^2 - 2\alpha^2}{\alpha^2} = \frac{(\alpha^2 + 1)^2}{\alpha^2} - \frac{2\alpha^2}{\alpha^2} = \frac{(\alpha^2 + 1)^2}{\alpha^2} - 2 = \frac{v^2}{\alpha^2} - 2 = \frac{v^2}{\alpha^2}$$

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

$$h(t) = \sin t + \cos t$$

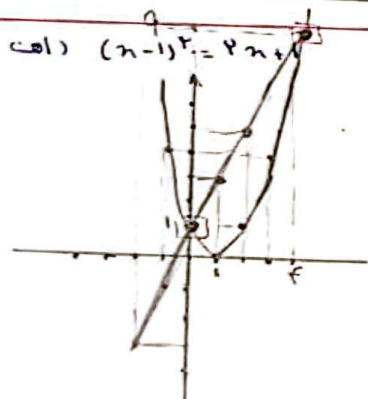
$$\frac{d}{dt} h(t) = \cos t - \sin t = 0 \rightarrow \cos t = \sin t \rightarrow \tan t = 1 \rightarrow t = \frac{\pi}{4}$$

$$y_s = -10\left(\frac{v_0}{v}\right) + 50\left(\frac{v}{v}\right) = 40 \text{ m/s}$$

$$-10t + 50t = 0$$

$$t(-10 + 50) = 0$$

$$t = 0 \quad \text{or} \quad t = 10 \text{ s}$$

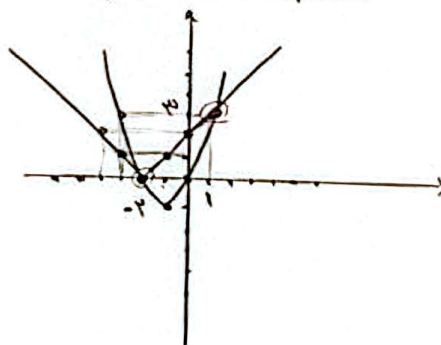


$$x^2 - 4x + 4 = 4x + 4$$

$$x^2 - 8x = 0$$

$$x(x - 8) = 0 \rightarrow \boxed{x = 0, 8}$$

$$x^2 + 4x = |x + 1|$$



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

$$x^2 + 3x - 1 = 0$$

$$\boxed{x = -1, x = 1}$$