

$$y = -x^2 + bx + 4, \text{ max } = 5, \text{ b} = ?$$

$$y_s = \frac{-b}{2a} = \frac{-(b^2 + 16)}{-4} = 5 \rightarrow b^2 + 16 = 20 \rightarrow b^2 = 4 \rightarrow b = \pm 2$$

سوال ۱۹

$$\text{الف) } f(x) = x^2 + 2x + 3$$

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

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

$$\text{ب) } f(x) = (4 - x^2)^2 + 2(4 - x^2) - 1$$

$$4 - x^2 = t \rightarrow t^2 - 2t - 1 = 0$$

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

$$t = \omega \rightarrow 4 - x^2 = \omega \rightarrow x^2 = -1 \quad \text{غیر ممکن}$$

$$t = -3 \rightarrow 4 - x^2 = -3 \rightarrow x^2 = 7 \rightarrow x = \pm \sqrt{7}$$

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

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

$$S = \frac{-b}{a} \rightarrow 4(\alpha + \beta) = \frac{14}{4} = 4 \rightarrow \alpha + \beta = 1$$

$$\beta = 3$$

$$P = \frac{c}{a} \rightarrow \frac{m}{4} = 1 \times 3 \rightarrow m = 12$$

$$4x^2 - 14x + 12 = 0 \quad \Delta > 0 \quad \checkmark$$

سوال ۲۰

۱,۷۵

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

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

$$4\alpha - \beta = 4 \rightarrow 4\alpha + 4\beta - 3\beta = 4$$

$$S = \frac{-b}{2a} = 2 = \alpha + \beta$$

$$4(\alpha + \beta) - 3\beta = 4$$

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

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

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

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

سوال ۲۱

۱,۷۵

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

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

$$(m+2)(m-1) = 0$$

$$m = 1$$

$$-x^2 + 4x - 1 = 0 \quad \Delta = 16 - 4 = 12 > 0 \quad \text{دو جواب}$$

$$m = -2$$

$$-2x^2 + 4x + 2 = 0 \quad \Delta = 16 - 16 = 0 \quad \text{یک جواب}$$

سوال ۲۲

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

$$\alpha\beta = 4$$

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

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

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

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

$$\frac{1}{1} + \frac{4}{1} = m \rightarrow m = \frac{5}{1}$$

$$x^2 - \frac{5x}{1} + 4 = 0 \quad \Delta > 0 \quad \checkmark$$

سوال ۲۳

۱,۷۵

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

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

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

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

$$2x^2 - 8x + 7 \rightarrow D \gamma = \checkmark$$

سوال ٥

١, ٧

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

$$x^2 - vx + y = 0 \rightarrow x^2 + y = vx$$

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

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

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

$$\rightarrow \left(\alpha + \frac{1}{\alpha}\right) \left(\alpha^2 + \frac{1}{\alpha^2} - v\right) = v\alpha \left(\frac{v}{\alpha} - 2\right) = \boxed{10}$$

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

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

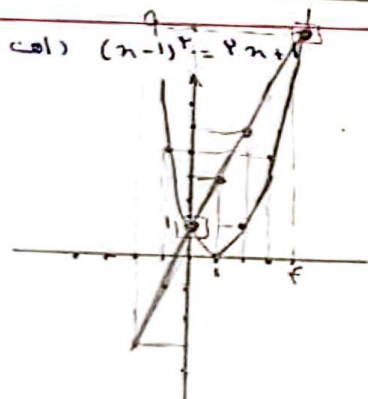
$$y_s = -10\left(\frac{10}{4}\right) + 20\left(\frac{10}{4}\right) = 9.4 \text{ m}$$

max z

$$-10t + 20t = 0$$

$$t(-10 + 20) = 0$$

$$t = 0 \text{ or } t = 2$$

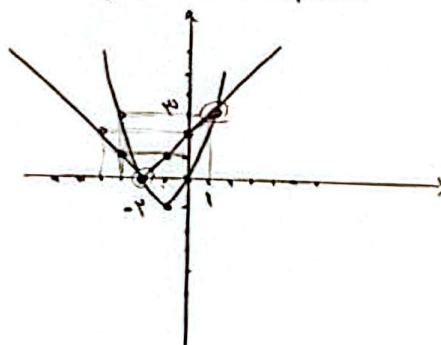


$$x^2 - 2x + 1 = 2x + 1$$

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

$$x(x - 4) = 0 \rightarrow \boxed{x = 0, 4}$$

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



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

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

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

سوال ١٥

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