

معادله درجه دوم: $y = -x^2 + bx + c$ داریم. مقدار b را بیابیم.

$$y_{max} = \frac{-\Delta}{4a} = 7 \Rightarrow \frac{-(b^2 + 12)}{-4} = 7 \Rightarrow b^2 + 12 = 28 \Rightarrow b^2 = 16 \Rightarrow b = \pm 4$$

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الف) $f(x) = x^2 + 2x + 3$

$t \geq x^2$

$t^2 + 2t + 3$

$\Delta = b^2 - 4ac$

$4 - 12 = -8 < 0$

پس معادله را حل نمی‌کنیم.

ب) $f(x) = (x - u)^2 - 2(x - u) - 15$

$t \geq x - u^2$

$t^2 - 2t - 15 = 0$

$(t - 5)(t + 3) = 0$

$t = 5 \Rightarrow x - u^2 - 5 = 0 \Rightarrow u^2 = x - 5$

$t = -3 \Rightarrow x - u^2 + 3 = 0 \Rightarrow u^2 = x + 3 \Rightarrow u = \pm \sqrt{x + 3}$

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در معادله $4x^2 - 14x + m = 0$ اگر $x = 2$ را جایگزین کنیم، داریم $4(2)^2 - 14(2) + m = 0$ و در جواب m را بیابیم.

$\alpha, \alpha + 2$

$S = \frac{-b}{a} \Rightarrow \alpha + \alpha + 2 = \frac{14}{4} \Rightarrow 2\alpha + 2 = 3.5 \Rightarrow 2\alpha = 1.5 \Rightarrow \alpha = 0.75$

$P = \frac{c}{a} = \frac{m}{4} = 1 \times 2 \Rightarrow m = 8$

$4x^2 - 14x + 8 = 0$
 $\Delta > 0$

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معادله $mx^2 - 9x + m - 1 = 0$ را در $x = 2$ جایگزین کنیم، داریم $4m - 18 + m - 1 = 0$

$2\alpha - \beta = 2 \Rightarrow 2\alpha + 2\beta - 2\beta = 2$

$2(\alpha + \beta) - 2\beta = 2$

$2\alpha = 2 \Rightarrow \alpha = 1$

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

$P = \frac{c}{a} = \frac{m-1}{4} = 0$

$m - 1 = 0$

$m = 1$

$4x^2 - 9x = 0$
 $\Delta > 0$

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معادله $-mx^2 + 4x + m - 2 = 0$ را در $x = 1$ جایگزین کنیم، داریم $-m + 4 + m - 2 = 0$

$P = 1 \Rightarrow \frac{c}{a} = 1 \Rightarrow \frac{m-2}{-m} = 1 \Rightarrow m - 2 = -m \Rightarrow 2m = 2 \Rightarrow m = 1$

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

$\Delta = 0 \Rightarrow m = -2 \Rightarrow -x^2 + 4x - 2 = 0$
 $\Delta = 16 - 8 = 8 > 0$

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آر، α و β را به هم وصل می‌کنیم. $x^2 - mx + p = 0$ در $x = \alpha$ و $x = \beta$ صفر می‌شود. $\alpha + \beta = m$ و $\alpha\beta = p$

$$P = \alpha\beta = \frac{c}{a} = 1^0$$

$$\alpha\beta = 2 \Rightarrow \alpha\beta \times \beta = 2 \Rightarrow \beta^2 = 2 \Rightarrow \beta = \frac{\sqrt{2}}{1}$$

$$\alpha + \frac{\sqrt{2}}{1} = m \Rightarrow \alpha = m - \frac{\sqrt{2}}{1} \Rightarrow \alpha = \frac{9}{2}$$

$$S \Rightarrow \alpha + \beta = -\frac{b}{a} \quad \frac{\sqrt{2}}{1} + \frac{9}{2} = m \Rightarrow \boxed{m = \frac{4\sqrt{2}}{2} + \frac{9}{2}} \quad 2x^2 - \frac{4\sqrt{2}}{2}x + \frac{9}{2} = 0 \checkmark$$

ما را در کتابتین بنویس. $x^2 - 4x + m = 0$ در $x = \alpha$ و $x = \beta$ صفر می‌شود.

$$\alpha, \beta = \alpha$$

$$S = \alpha + \beta = -\frac{b}{a} \Rightarrow 4\alpha = 4 \Rightarrow \boxed{\alpha = 1} \quad \boxed{\beta = 3\alpha = 3}$$

$$P = \frac{c}{a} = \alpha\beta \Rightarrow \boxed{m = 1^0} \quad 2x^2 - 4x + 1 = 0 \checkmark$$

$$\alpha^2 + \frac{1}{\alpha^2} = P \quad \alpha^2 - 7\alpha + 1 = 0 \quad \alpha^2 - 7\alpha + 1 > 0 \quad \alpha^2 + 1 > 7\alpha$$

$$(\alpha)^2 + \left(\frac{1}{\alpha}\right)^2 \Rightarrow \left(\alpha + \frac{1}{\alpha}\right) \left(\alpha^2 + \frac{1}{\alpha^2} - 1\right) \Rightarrow \alpha + \frac{1}{\alpha} = \frac{\alpha^2 + 1}{\alpha} = \frac{7\alpha}{\alpha} = 7$$

$$\alpha^2 + \frac{1}{\alpha^2} = \frac{\alpha^2 + 1}{\alpha^2} \Rightarrow \frac{(\alpha^2 + 1)^2 - 4\alpha^2}{\alpha^2} \Rightarrow \frac{(\alpha^2 + 1)^2}{\alpha^2} - \frac{4\alpha^2}{\alpha^2} = 49 - 4 = 45$$

$$\left(\alpha + \frac{1}{\alpha}\right) \left(\alpha^2 + \frac{1}{\alpha^2} - 1\right) = 7(45 - 1) = \boxed{308}$$

فرض کنیم $h(t) = -1.0t^2 + 0.5t$ از رابطه t از زمان $t = 0$ تا $t = 0.5$ $h(t)$ را رسم می‌کنیم.

آنگاه $\max_{t \in [0, 0.5]} h(t) = ?$

$$a_5 = -\frac{b}{2a} = -\frac{0.5}{-2.0} = 0.125$$

$$y_5 = -1.0\left(\frac{0.5}{2}\right) + 0.5\left(\frac{0.5}{2}\right) = \boxed{0.125}$$

$$-1.0t^2 + 0.5t = 0$$

$$t(-1.0t + 0.5) = 0$$

$$t = 0 \quad \boxed{t = 0.5}$$

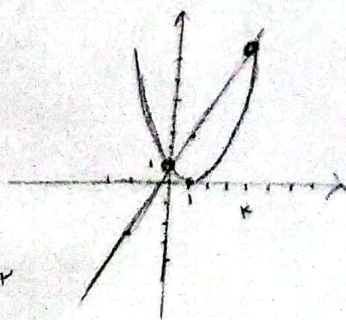
$$(n-1)^2 = 2n+1$$

$$n^2 - 2n + 1 = 2n + 1$$

$$n^2 - 4n = 0$$

$$n(n-4) = 0$$

$$\boxed{n = 0, 4}$$



$$x^2 + 2x = 2n+1$$

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

$$n = 2, 1$$

$$\boxed{n = 2, 1}$$

جواب 2

