رادین ملکیان یازدهم A

۲۰ عالی نوشتی!

۱) $y_s = \frac{-\Delta}{4a} = \frac{4ac-b^2}{4a} = \frac{-12-b^2}{-4} = \frac{b^2+12}{4} = 7 \Rightarrow \boxed{b = \pm 4}$ ✓ (۲)

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۲) الف) $f(x) = x^4 + 2x^2 + 3 \xrightarrow{x^2=t} t^2 + 2t + 3 = 0 \Rightarrow \boxed{\Delta < 0 \Rightarrow \text{جواب ندارد}}$ ✓ (۲)

ب) $f(x) = (4-x^2)^2 - 2(4-x^2) - 15 \xrightarrow{4-x^2=t} t^2 - 2t - 15 = (t-5)(t+3) = 0$

$\Rightarrow t = -3 \Rightarrow 4 - x^2 = -3 \Rightarrow x^2 = 7 \Rightarrow \boxed{x = \pm\sqrt{7}}$ ✓

یا $t = 5 \Rightarrow 4 - x^2 = 5 \Rightarrow x^2 = -1$ غق

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۳) $S = -\frac{b}{a} = -\frac{-16}{4} = 4 \Rightarrow \left.\begin{array}{l}\alpha + \beta = 4 \\ \beta = \alpha + 2\end{array}\right\} \Rightarrow 2\alpha + 2 = 4 \Rightarrow \alpha = 1,\ \beta = 3$ ✓ (۲)

$P = \frac{c}{a} = \frac{m}{4} = \alpha\beta = 3 \Rightarrow m = 12$ ✓ $\rightarrow 4x^2 - 16x + 12 = 0 \rightarrow \Delta > 0$

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۴) $S = \alpha + \beta = -\frac{b}{a} = -\frac{-6}{3} = 2 \Rightarrow \left.\begin{array}{l}\alpha + \beta = 2 \\ 2\alpha - \beta = 4\end{array}\right\} \Rightarrow \alpha = 2,\ \beta = 0$ (۲)

$P = \frac{c}{a} = \alpha\beta = 0 \Rightarrow \frac{m-1}{3} = 0 \Rightarrow m = +1$ ✓ $\rightarrow 3x^2 - 6x = 0 \quad \Delta > 0$

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۵) $\alpha = \frac{1}{\beta}$ (۲)

$P = \alpha\beta = \frac{c}{a} = \frac{m^2-2}{-m}$

$\left\{ \frac{1}{\beta} \times \beta = 1 = \frac{m^2-2}{-m} \Rightarrow m^2 - 2 = -m \Rightarrow m^2 + m - 2 = 0 \Rightarrow m = 1,\ m = -2 \right.$

$m = 1 \Rightarrow -x^2 + 4x - 1 = 0 \rightarrow \Delta > 0$ ✓

$m = -2 \Rightarrow 2x^2 + 4x + 2 = 0 \Rightarrow \Delta = 0$ غق $\Rightarrow \boxed{m = 1}$ ✓

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۶) $\left.\begin{array}{l}P = \frac{c}{a} = 3 \\ \alpha\beta^2 = 4\end{array}\right\} \Rightarrow \frac{1}{\beta} = \frac{3}{4} \Rightarrow \beta = \frac{4}{3} \Rightarrow \alpha = \frac{9}{4}$ (۲)

$S = -\frac{b}{a} = m \Rightarrow \alpha + \beta = \frac{4}{3} + \frac{9}{4} = \boxed{\frac{43}{12} = m}$ ✓ $\rightarrow x^2 - \frac{43}{12}x + 3 \rightarrow \Delta > 0$ ✓

۱۷) (۲)

$\alpha = 3\beta$

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

$P = m = \alpha\beta$, $\alpha\beta = 3$ $\Rightarrow m = 3$ ✓ $\rightarrow x^2 - 4x + 3 \to \Delta > 0$

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۱۸) (۲)

$P = \frac{c}{a} = 2 \Rightarrow \beta = \frac{2}{\alpha}$ به توان ۲ $\Rightarrow \beta^2 = \frac{4}{\alpha^2}$

$S = -\frac{b}{a} = 7$

$P = 2 = \frac{c}{a}$

$\alpha^2 + \frac{4}{\alpha^2} = \alpha^2 + \beta^2 = S^2 - 2P = 49 - 4 = 45$ ✓

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۱۹) (۲)

$h(t) = -10t^2 + 50t = -10(t^2 - 5t) = -10t(t-5) \Rightarrow -10t(t-5) = 0$ $\Rightarrow t = 0$ لحظه‌ی پرتاب، $t = 5$ لحظه‌ی برخورد با زمین ✓

$y_S = \frac{-\Delta}{4a} = \frac{0 - 2500}{-40} \Rightarrow y_S = \frac{2500}{4} = 625$ ✓

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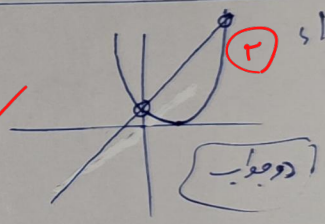
۲۰) (۲)



الف) $(x-1)^2 = 2x+1 \Rightarrow x^2 - 2x + 1 = 2x + 1 \Rightarrow x^2 - 4x = 0 \Rightarrow x = 0$, $x = 4$ ✓

ب) $x^2 + 2x = |x+2|$

x	$-\infty$	-2	$+\infty$
$x+2$	$-$	0	$+$

$x \geq -2 \Rightarrow x^2 + 2x = x + 2 \Rightarrow x^2 + x - 2 = 0 \Rightarrow x = 1$, $x = -2$

$x < -2 \Rightarrow x^2 + 2x = -x - 2 \Rightarrow x^2 + 3x + 2 = 0 \Rightarrow x = -1$, $x = -2$

$\Rightarrow x = -2$

$\Rightarrow x = 1$, $x = -2$ ✓