① $\frac{-b}{2a} = \frac{-b}{-4} = \frac{b}{4} \Rightarrow \frac{-b^2}{4} + \frac{2b^2}{4} + 2 = 4 \Rightarrow \frac{b^2}{4} = 4$

$\Rightarrow b^2 = 16 \Rightarrow b = \pm 4$

②

الف) $x^2 = t \Rightarrow t^2 + 2t + 2 = 0 \Rightarrow \Delta < 0 \Rightarrow$ جواب ندارد.

ب) $(4 - x^2) = t \Rightarrow t^2 - 2t - 15 = 0 \Rightarrow (t+3)(t-5) = 0$

$\Rightarrow \begin{cases} 4 - x^2 = -3 \Rightarrow x^2 = 7 \Rightarrow x = \pm\sqrt{7} \\ 4 - x^2 = 5 \Rightarrow x^2 = -1 \Rightarrow \text{جواب ندارد} \end{cases}$

③ $a, a+2 \Rightarrow S = 2a + 2 = \frac{16}{4} = 4 \Rightarrow a = 1, a+2 = 3$

$P = 3 \times 1 = 3 = \frac{m}{4} \Rightarrow \boxed{m = 12}$

④ $1/5\alpha - 1/5\beta + 2\alpha + 2\beta = \frac{3}{2}(\alpha - \beta) + \frac{1}{2}(\alpha + \beta) = 0$

$S = \frac{6}{4} = 2, P = \frac{m-1}{4} \Rightarrow \frac{4}{2}\sqrt{4 - \frac{4(m-1)}{4}} + \frac{1}{2} \times 2 = 4$

$= \sqrt{4 - \frac{4(m-1)}{4}} = 3 \times \frac{2}{2} = 2$

$\Rightarrow 4 - \frac{4(m-1)}{2} = 4 \Rightarrow \frac{4(m-1)}{2} = 0 \Rightarrow \boxed{m = 1}$

⑤ $\frac{m^2 - 2}{-m} = 1 \Rightarrow m^2 + m - 2 = 0 \Rightarrow (m-1)(m+2) = 0$

$\Rightarrow m = 1, -2$

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۷) $\alpha\beta^2 = P\beta = 2^2\beta = 4 \Rightarrow \beta = \frac{4}{2} \Rightarrow \frac{12}{9} - \frac{4^2 m}{3} + 3 = 0$

$\frac{12^2 \cdot 2}{9 \cdot 2} = \frac{4^2 m}{3^1} \Rightarrow 12m = 48 \Rightarrow m = \frac{48}{12}$

۸) $\alpha, 2\alpha \Rightarrow S = 3\alpha, P = 2\alpha^2 \Rightarrow S = 4 = 3\alpha \Rightarrow \alpha = 1$

$P = 2 \times 1 = \frac{m}{1} \Rightarrow \boxed{m = 2}$

۹) $\alpha^2 + \frac{8}{\alpha^2} = (\alpha + \frac{2}{\alpha})(\alpha^2 + \frac{4}{\alpha^2} + 2) = (\frac{\alpha^2 + 2}{\alpha})(\alpha^2 + \frac{4}{\alpha^2} + 2)$

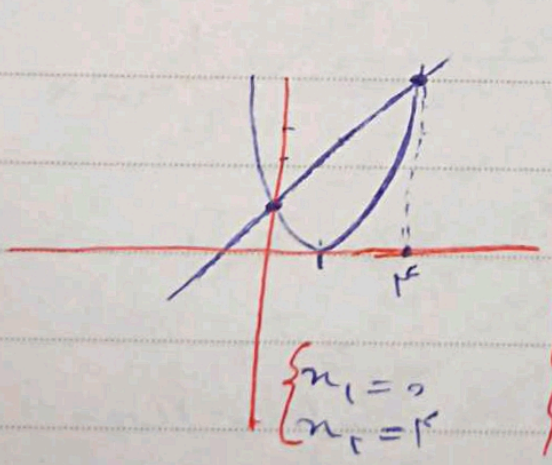
$\alpha^2 + 2 = 7\alpha$

$\alpha^2 + \frac{4}{\alpha^2} = S^2 - 2P = 49 - 4 = 45$ $\Rightarrow (\frac{7\alpha}{\alpha})(45 + 2) = 7(21) = 147$

۱۰) $t_{max} = \frac{-b}{2a} = \frac{-5}{-10} = 0.5$ $h_{max} = -10 \times 0.25 + 20 \times 0.5$

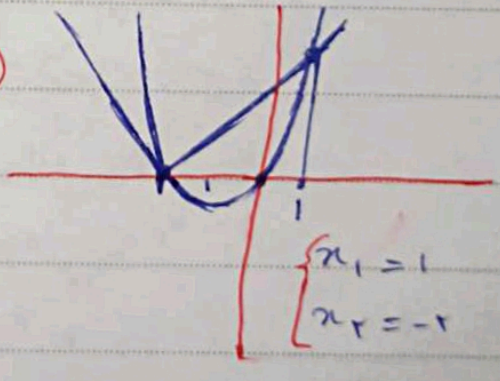
$= -2.5 + 10 = 7.5$

۱۱) الف)



$\begin{cases} x_1 = 0 \\ x_2 = 4 \end{cases}$

ب)



$\begin{cases} x_1 = 1 \\ x_2 = -1 \end{cases}$

— Arman