

$\Rightarrow -\frac{b}{2a} = u \rightarrow$ $\frac{-1}{2a-2} = 2 \Rightarrow -1 = 2a-2 \Rightarrow a = \frac{1}{2}$
 $\Rightarrow -\frac{1}{2}u^2 + u + 2 = 0 \xrightarrow{\times 2} -u^2 + 2u + 4 = 0 \xrightarrow{\times -1} u^2 - 2u - 4 = 0 \Rightarrow (u-4)(u+2) \Rightarrow u = -2$
 $u = 4$
 نه گفته در طول + قیاس پس $u = 4$ که جواب

$u \mid u_1 \quad u_2$
 $f(u) \mid - \quad + \quad -$
 $\Delta > 0 \Rightarrow b^2 - 4ac > 0$
 $\Rightarrow 2a - 2m^2 > 0$
 $\Rightarrow 2m^2 < 2a$
 $\Rightarrow m^2 < \frac{2a}{2}$
 $\Rightarrow -\frac{a}{1} < m < \frac{a}{1} \quad (II)$
 $(I) \cap (II) \Rightarrow (-\frac{a}{1} < 0)$
 $-\frac{a}{1} < m < 0$ که جواب

$u^2 - 5u + p = 0 \Rightarrow u^2 - 2u + \frac{2}{9} = 0 \xrightarrow{\times 9} 9u^2 - 18u + 2 = 0 \rightarrow$ جواب
 $u_1 = \frac{3 + \sqrt{5}}{9}, u_2 = \frac{3 - \sqrt{5}}{9}$
 $s = -\frac{b}{a} \Rightarrow \frac{3 + \sqrt{5}}{9} + \frac{3 - \sqrt{5}}{9} = \frac{6}{9} = 2$
 $p = \frac{c}{a} \Rightarrow \frac{3 + \sqrt{5}}{9} \times \frac{3 - \sqrt{5}}{9} = \frac{9 - 5}{9} = \frac{4}{9}$

$2\alpha^2 + \beta^2 = \frac{\alpha^2 + \beta^2}{\alpha^2 - 2\beta} + 2\alpha^2 \Rightarrow 5^2 - 2\alpha\beta + 2\alpha^2 = 14 \Rightarrow 2\alpha^2 - 2\alpha\beta + 2 = 0 \xrightarrow{\div 2} \alpha^2 - \alpha\beta + 1 = 0$
 $\alpha^2 - \alpha\beta + 1 = 0 \Rightarrow \alpha^2 - \alpha(2 - \alpha) + 1 = 0 \Rightarrow \alpha^2 - 2\alpha + \alpha^2 + 1 = 0 \Rightarrow 2\alpha^2 - 2\alpha + 1 = 0 \xrightarrow{\div 2} \alpha^2 - \alpha + \frac{1}{2} = 0$
 $\alpha^2 - 2\alpha + 1 = 0 \Rightarrow (\alpha - 1)^2 = 0 \Rightarrow \alpha = 1$
 $p = \alpha\beta = \frac{m+2}{2} = 2 \Rightarrow m+2 = 4 \Rightarrow m = 2 \rightarrow$ جواب
 $\hookrightarrow 2 \times 1 = 2$
 سؤا $\alpha < \beta$ برقرار است $\checkmark$
 $\odot S = \alpha + \beta = 2 \Rightarrow \beta = 2 - \alpha \Rightarrow \beta = 2 - 1 = 1 \rightarrow$

$S(2, 9)$
 $y = a(u-h)^2 + k \Rightarrow y = a(u-2)^2 + 9 \xrightarrow{(0, 5)} 5 = a(0-2)^2 + 9 \Rightarrow 5 = 4a + 9 \Rightarrow 4a = -4 \Rightarrow a = -1$
 $\Rightarrow y = -1(u-2)^2 + 9 > 0 \Rightarrow (u-2)^2 - 9 < 0 \Rightarrow u^2 + 4 - 4u - 9 < 0 \Rightarrow u^2 - 4u - 5 < 0 \Rightarrow (u-5)(u+1) < 0 \Rightarrow u = 5, u = -1$
 $\frac{-1}{2} < u < \frac{5}{2} \Rightarrow (-1, 5)$ جواب

$\alpha u^2 - u + 9\beta = 0$ $\beta > 0,$ $S: \alpha + \beta = -\frac{b}{a} = -\frac{1}{9}, \quad p = \alpha\beta = \frac{c}{a} = \frac{1}{9} \Rightarrow \alpha^2 = 9 \Rightarrow \alpha = \pm 3$ $\alpha = 3 \Rightarrow \frac{1}{9} = 3 + \beta \Rightarrow \beta = -\frac{10}{9} \quad \text{ق.ق.ع.} \rightarrow \beta > 0 \text{ خ}$ $\boxed{\alpha = -3} \Rightarrow -\frac{1}{9} = -3 + \beta \Rightarrow \boxed{\beta = \frac{26}{9}} \checkmark$ $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{S}{p} = -\frac{1}{9} \times \frac{1}{-\frac{1}{9}} = \frac{1}{1} \quad \text{لجواب}$	6
$\left. \begin{aligned} m\beta &= 2m - \beta^2 \\ \alpha^2 - m\beta &= 1 \end{aligned} \right\} \Rightarrow \frac{\alpha^2 + \beta^2 - 2m}{S^2 - 4P} = 1 \Rightarrow (\alpha + \beta)^2 + 2m - 4m = 1 \Rightarrow (\alpha + \beta)^2 + 2m = 1$ $\frac{c}{a} = \alpha\beta = -2m, \quad \alpha + \beta = -m$ $\Rightarrow (\alpha + \beta)^2 + 2m = 1 \Rightarrow m^2 + 2m - 1 = 0 \Rightarrow (m - 2)(m + 2) = 0 \Rightarrow \begin{aligned} m &= 2 \\ m &= -2 \end{aligned}$ $u^2 + 2u - 2 = 0 \Rightarrow \Delta = 2^2 - 4 \times 1 \times (-2) = 20 > 0 \checkmark$ $u^2 + 2u + 1 = 0 \Rightarrow \Delta = 1^2 - 1 \times 1 \times 1 = 0 < 0 \text{ خ}$ $\alpha + \beta = -m = -2 \Rightarrow \boxed{\alpha + \beta = -2} \rightarrow \text{جواب}$	7
$f(u) = mu^2 + \varepsilon u + \frac{m}{\varepsilon} + V \rightarrow \text{مشتق} = -\frac{b}{2a} = -\frac{\varepsilon}{2m}, \quad \text{مشتق دوم} = \frac{-\Delta}{4a} = \frac{-(\varepsilon^2 - 4ac)}{4a} = 1$ $1 = m\left(-\frac{\varepsilon}{2m}\right)^2 + \varepsilon\left(-\frac{\varepsilon}{2m}\right) + \frac{m}{\varepsilon} + V \Rightarrow 1 = m\left(\frac{\varepsilon^2}{4m^2}\right) + \left(-\frac{\varepsilon^2}{2m}\right) + \frac{m}{\varepsilon} + V$ $\Rightarrow 1 = -\frac{\varepsilon}{m} + \frac{m}{\varepsilon} + V \Rightarrow 1 = -\frac{\varepsilon}{m} + \frac{m}{\varepsilon} \Rightarrow 1 = -\frac{\varepsilon + m^2}{\varepsilon m} \Rightarrow \varepsilon m = -\varepsilon - m^2 \Rightarrow m^2 + \varepsilon m + 1 = 0$ $\Rightarrow (m - 2)(m + 2) = 0 \Rightarrow m = 2 \Rightarrow \Delta < 0 \quad \text{ق.ق.ع.}$ $m = -2 \Rightarrow \Delta > 0 \checkmark$ $f(u) = mu^2 + \varepsilon u + \frac{m}{\varepsilon} + V \Rightarrow -2u^2 + \varepsilon u + 4 = f(u) \rightarrow -2u^2 + \varepsilon u + 4 = 0 \Rightarrow x = 2$ $u^2 + 2u - 12 = 0 \Rightarrow (u + 4)(u - 3) = 0 \Rightarrow u = -4 \text{ أو } u = 3$ $\rightarrow u = 3 \rightarrow u = 1 \rightarrow \text{جواب}$	8
$-\frac{b}{2a} = u = 2, \quad y = \frac{-\Delta}{4a} = 4, \quad c = \varepsilon$ $y = a(u - h)^2 + k \Rightarrow y = a(u - 2)^2 + 4 \Rightarrow 4 = 2a + 4 \Rightarrow a = -\frac{1}{2}$ $\Rightarrow y = -\frac{1}{2}(u^2 - 4u + 4) + 4 \Rightarrow y = -\frac{u^2}{2} + 2u + 2 = 0 \Rightarrow \frac{\alpha + \beta}{\alpha\beta} = -\frac{\varepsilon}{1} = -\frac{1}{1} \rightarrow \text{جواب}$	9
$u = 2 \Rightarrow \varepsilon - 1a - 1 + 9a^2 + 4a + c = 0 \Rightarrow 9a^2 - 2a - 1 = 0 \Rightarrow a = 1 \text{ أو } a = -\frac{1}{9}$ $\Rightarrow u^2 - 1u + 12 = 0 \Rightarrow (u - 2)(u - 4) = 0 \Rightarrow \begin{aligned} u &= 2 \\ u &= 4 \end{aligned}$ $\Rightarrow u^2 - \frac{1}{9}u + \frac{4}{9} = 0 \Rightarrow \Delta > 0 \checkmark$ $\boxed{u = \frac{4}{9} \text{ و } 4} \rightarrow \text{جواب}$	10