

الف) $u^2 - 4u + 9 = 1 \rightarrow (u-3)^2 = 1 \rightarrow u-3 = \pm 1$
 $\rightarrow u^2 - 4u + 9 = 1 \rightarrow u^2 - 4u + 8 = 0$
 $\rightarrow u^2 + 1u + 7 = 0 \rightarrow u^2 + 1u + 14 = 9 \rightarrow (u+5)^2 = 9$
 $u+5 = \pm 3 \rightarrow \begin{cases} u = -8 \\ u = -2 \end{cases}$

الف) $u^2 - 5u + p = 0 \rightarrow (u-2)(u-3) = 0 \rightarrow \begin{cases} u = 2 \\ u = 3 \end{cases}$
 $u^2 - 5u + p = 0 \rightarrow (u-5)(u+2) = 0 \rightarrow \begin{cases} u = 5 \\ u = -2 \end{cases}$

الف) $u^2 - 3u - a = 0 \rightarrow u = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \sqrt{\Delta} = \sqrt{b^2 - 4ac}$
 $\sqrt{\Delta} = \sqrt{9 - (1)(1)(-a)} = \sqrt{9 + a}$
 $\sqrt{\Delta} = \sqrt{9 + 10} = \sqrt{19}$
 $u = \frac{3 \pm \sqrt{19}}{2}, u = \frac{3 - \sqrt{19}}{2}$

الف) $u^2 - 3u + 2 = 0 \rightarrow au^2 + bu + c = 0 \rightarrow a + c + b = 0 \rightarrow \begin{cases} u = 1 \\ u = \frac{c}{a} = \frac{2}{1} = 2 \end{cases}$
 $u^2 - 3u + 2 = 0$
 $\rightarrow \begin{cases} u = -1 \\ u = -\frac{c}{a} = -\frac{2}{1} = -2 \end{cases}$

الف) $u^2 - 12u + 17 = 0 \rightarrow u^2 - 12u + 36 = 0 \rightarrow (u-6)^2 = 0 \rightarrow u = 6$
 $u^2 - 12u + 17 = 0 \rightarrow (u-3)(u-11) = 0 \rightarrow \begin{cases} u = 3 \\ u = 11 \end{cases}$
 $u^2 - 10u + 17 = 0 \rightarrow (u-3)(u-11) = 0 \rightarrow \begin{cases} u = 3 \\ u = 11 \end{cases}$

الف) $\Delta = b^2 - 4ac = 2^2 + (-4)(-3)(-1) = 13$ $u = \frac{-b \pm \sqrt{\Delta}}{2a}$

→ $\Delta = b^2 - 4ac = 1 + (-4)(2)(2) = -15$ $u = \frac{-2 \pm \sqrt{13}}{-4}$, $u = \frac{-2 \pm \sqrt{13}}{-4}$

→ $\Delta = b^2 - 4ac = 14 + (-4)(2)(2) = 0$

→ $\Delta = b^2 - 4ac = 1 + (-4)(2)(1) = -7$

ندارد
جواب دلتا منفی است و در مجموعه اعداد حقیقی

جواب دلتا صفر است پس دو ریشه مساوی یا یک ریشه مضاعف دارد. // ریشه مساوی دارد //

$b + a + c = 0 \rightarrow u = 1, u = \frac{c}{a} = \frac{1}{2} = 0.5$

$2u^2 - 3u + a = 0$

(الف)

$2u^2 - 3u + a = 0 \rightarrow \Delta = b^2 - 4ac = 9 + (-4)(2)(a) = 9 - 8a$

د) $\Delta > 0$ یعنی $9 - 8a > 0$
پس $a < \frac{9}{8}$

$9 - 8a = 0 \rightarrow a = \frac{9}{8}$ (ب)
ا) $a < \frac{9}{8}$

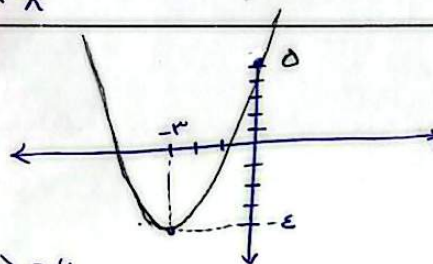
$y = u^2 + 4u + a$

$au^2 + bu + c$ y $a > 0$
 $u^2 + 4u + a$

در نقطه تابع $a > 0$ تابع به سمت بالا می‌رود +

$u^2 + 4u + a = y$

$\min \left| y = -\frac{\Delta}{4a} = -\frac{(b^2 - 4ac)}{4a} = -\frac{16}{4} = -4 \right.$
 $u = -\frac{b}{2a} = -\frac{4}{2} = -2$

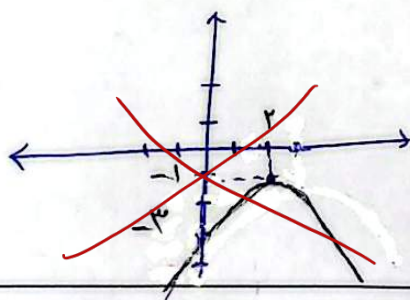


$y = -u^2 + \varepsilon u - 3 \rightarrow au^2 + bu + c$ y $a < 0$

در نقطه تابع $a < 0$ تابع به سمت پایین می‌رود +

$y_{\max} = -(-2)^2 + \varepsilon(-2) - 3 = 1$

$\max \left| y = -\frac{\Delta}{4a} = -\frac{(b^2 - 4ac)}{4a} = \frac{\varepsilon}{-4} = -\frac{\varepsilon}{4} \right.$
 $u = -\frac{b}{2a} = -\frac{\varepsilon}{-2} = \frac{\varepsilon}{2} = 2$



الف) $5^2 - 2p = (-\frac{b}{a})^2 + (-2)(\frac{c}{a}) = (-\frac{3}{1})^2 + (-2)(\frac{1}{1}) = 9 - 2 = 7$

ب) $6^2 - 2ps = (-\frac{b}{a})^2 + (-2)(\frac{c}{a})(-\frac{b}{a}) = (-\frac{3}{1})^2 + (2)(\frac{1}{1})(\frac{3}{1}) = 9 + 6 = 15$