

$$x^2 - 4x + 9$$

الف) $x^2 - 4x + 8 = 0 \Rightarrow x^2 - 4x + 8 + 1 - 1 = 0 \Rightarrow (x-2)^2 = 1 \Rightarrow x-2 = \pm 1 \Rightarrow \begin{cases} x=3 \\ x=1 \end{cases}$

ب) $x^2 + 14x + 7 = 0 \Rightarrow x^2 + 14x + 7 + 9 - 9 = 0 \Rightarrow x^2 + 14x + 16 = 9 \Rightarrow (x+4)^2 = 9 \Rightarrow x+4 = \pm 3 \Rightarrow \begin{cases} x=-1 \\ x=-7 \end{cases}$

الف) $x^2 - 5x + 6 = 0 \Rightarrow (x-2)(x-3) = 0 \Rightarrow \begin{cases} x=2 \\ x=3 \end{cases}$
 حاصل ضرب اعداد داخل پرانتز

ب) $x^2 - 5x - 14 = 0 \Rightarrow (x+2)(x-7) = 0 \Rightarrow \begin{cases} x=-2 \\ x=7 \end{cases}$
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الف) $x^2 - 3x - 5 = 0$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a}$ $\Delta = b^2 - 4ac$
 $x = \frac{3 \pm \sqrt{9+20}}{2} \Rightarrow \begin{cases} x = \frac{3+\sqrt{29}}{2} \\ x = \frac{3-\sqrt{29}}{2} \end{cases}$

ب) $2x^2 - 4x + \frac{1}{2} = 0$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a}$ $\Delta = b^2 - 4ac$
 $x = \frac{4 \pm \sqrt{16-2}}{4} \Rightarrow \begin{cases} x = \frac{4+\sqrt{14}}{4} \\ x = \frac{4-\sqrt{14}}{4} \end{cases}$

الف) $x^2 - 3x + 2 = 0 \Rightarrow (x-2)(x-1) = 0 \Rightarrow \begin{cases} x=2 \\ x=1 \end{cases}$

ب) $4x^2 + x - 3 = 0 \Rightarrow x^2 + x - 12 = 0 \Rightarrow (x-3)(x+4) = 0 \Rightarrow \begin{cases} x=3 \\ x=-4 \end{cases}$

الف) $x^2 - 12x + 35 = 0 \Rightarrow x^2 - 12x + 35 = 0 \Rightarrow (x-5)(x-7) = 0 \Rightarrow \begin{cases} x=5 \\ x=7 \end{cases}$

ب) $3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + 21 = 0 \Rightarrow (x-3)(x-7) = 0 \Rightarrow \begin{cases} x=3 \\ x=7 \end{cases}$

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

ب) $2u^2 - u + 2 = 0 \Rightarrow u = \frac{1 \pm \sqrt{1-16}}{4} \rightarrow \Delta$ منفی و ریشه ندارد $\Rightarrow \begin{cases} u = \frac{1 + \sqrt{1-16}}{4} \\ u = \frac{1 - \sqrt{1-16}}{4} \end{cases} \rightarrow \begin{cases} u = \frac{1 + \sqrt{-15}}{4} \\ u = \frac{1 - \sqrt{-15}}{4} \end{cases}$

ج) $2u^2 - 5u + 2 = 0 \Rightarrow u = \frac{5 \pm \sqrt{25-16}}{4} \Rightarrow u = \frac{5}{4} = 1.25$ (ریشه)

د) $2u^2 - u + 1 = 0 \Rightarrow u = \frac{1 \pm \sqrt{1-8}}{4} \rightarrow \Delta$ منفی و ریشه ندارد

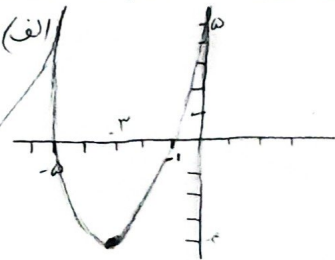
$\Delta = b^2 - 4ac$ $2u^2 - 3u + a \Rightarrow \Delta = 9 - 4a$

$\Delta > 0 \Rightarrow 9 - 4a > 0 \Rightarrow a < \frac{9}{4}$

$\Delta \geq 0 \rightarrow 9 - 4a \geq 0 \Rightarrow \frac{9}{4} \geq a$ $\Delta < 0 \rightarrow 9 - 4a < 0 \Rightarrow a > \frac{9}{4}$ $\Delta = 0 \Rightarrow 9 - 4a = 0 \Rightarrow a = \frac{9}{4}$

ext $\left| \frac{-b}{2a} \Rightarrow \frac{-3}{2} = -1.5 \right|$
 $9 - 4(1.5) = -4.5$

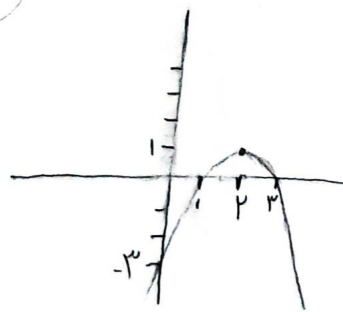
$y = u^2 + 6u + 5$ (الف)
min $\left| \frac{-3}{2} = -1.5 \right|$



$(u+5)(u+1) = 0$
 $\Rightarrow \begin{cases} u = -5 \\ u = -1 \end{cases}$

ext $\left| \frac{-b}{2a} = \frac{-3}{-2} = 1.5 \right|$
 $-4 + 4(1.5) = 2$

max $\left| \frac{3}{2} = 1.5 \right|$



$y = -u^2 + 6u - 3$ (ب)
 $y = u^2 + 6u + 3$ (ج)
 $y = (u+3)(u+1) \Rightarrow \begin{cases} u = -3 \\ u = -1 \end{cases}$

در نقاط $(1, 0)$ و $(3, 0)$

$P = \frac{C}{a} = \frac{-2}{1} = -2$

$S^2 - 2P = (3)^2 - 2(-2) = 9 - (-4) = 13$

$S^2 - 2SP = (3)^2 - 2(3)(-2) = 9 + 12 = 21$

$u^2 - 3u - 2 = 0$ (الف)

$S = -\frac{b}{a} = -\frac{-3}{1} = 3$