

رشته فارسی معادله زیر به صورت مربع کامل:

الف) $x^2 - 6x + 8 = 0 \xrightarrow{+1} x^2 - 6x + 9 = 1 \rightarrow (x-3)^2 = 1 \rightarrow x-3 = \pm 1$
 $\Rightarrow x-3 = \pm 1 \rightarrow x-3 = +1 \Rightarrow x = 4$ جواب.
 $\rightarrow x-3 = -1 \Rightarrow x = 2$

ب) $x^2 + 8x + 7 = 0 \xrightarrow{+9} x^2 + 8x + 16 = 9 \rightarrow (x+4)^2 = 9$ جواب.
 $\Rightarrow (x+4)^2 = 9 \rightarrow x+4 = \pm 3 \rightarrow x+4 = -3 \rightarrow x = -7$
 $\rightarrow x+4 = +3 \rightarrow x = -1$

الف) $x^2 - 5x + 6 = 0 \xrightarrow{\text{جمله مشترک}} (x-2)(x-3) = 0 \Rightarrow \begin{cases} x=2 \\ x=3 \end{cases}$
 $\xrightarrow{-2 \times (-3)} \quad \xrightarrow{5 - 2 \times (-3)}$

ب) $x^2 - 5x - 14 = 0 \xrightarrow{\text{جمله مشترک}} (x-7)(x+2) = 0 \Rightarrow \begin{cases} x=7 \\ x=-2 \end{cases}$
 $\xrightarrow{-7 \times 2} \quad \xrightarrow{5 \times 2}$

الف) $x^2 - 3x - 5 = 0 \xrightarrow{\Delta = b^2 - 4ac = 9 + 20 = 29} x = \frac{-b \pm \sqrt{29}}{2a} \rightarrow \Delta$
 $\Rightarrow x = \frac{3 \pm \sqrt{29}}{2}$ جواب.

ب) $2x^2 - 4x + \frac{1}{2} = 0 \xrightarrow{\Delta = 16 - 4 = 12} x = \frac{1 \pm \sqrt{12}}{2} \rightarrow \Delta$
 $\xrightarrow{b^2 - 4ac}$
 $\Rightarrow x = \frac{1 \pm 2\sqrt{3}}{2} \rightarrow x = \frac{1}{2} \pm \frac{2\sqrt{3}}{2} \rightarrow x = 1 \pm \frac{\sqrt{3}}{2}$ جواب.

الف) $x^2 - 3x + 2 = 0 \xrightarrow{\text{نکته معروف} \quad a+b+c=0} \begin{cases} x=1 \\ x=\frac{c}{a}=2 \end{cases}$

ب) $4x^2 + x - 3 = 0 \xrightarrow{\text{نکته معروف} \quad a+c=b} \begin{cases} x=-1 \\ x=-\frac{c}{a} = \frac{3}{4} \end{cases}$

الف) $5x^2 - 12x + 7 = 0 \xrightarrow{\text{روس}} x^2 - 12x + 35 = 0$
 $\Rightarrow (x-7)(x-5) = 0 \Rightarrow \begin{cases} x = \frac{7}{5} \\ x = \frac{5}{5} = 1 \end{cases}$ جمله مشترک.

$\begin{cases} x = \frac{7}{5} \\ x = \frac{5}{5} = 1 \end{cases}$

ب) $3x^2 - 10x + 7 = 0 \xrightarrow{\text{روس}} x^2 - 10x + 21 = 0 \rightarrow (x-7)(x-3) = 0$ جمله مشترک.

$$\Delta = b^2 - 4ac \quad \left(\text{دو ریشه حقیقی متعادل دارند} \right) \quad \Delta > 0$$

$$\text{الف) } 3x^2 + 5x - 1 = 0 \rightarrow \Delta = 25 - 12 \Rightarrow \Delta = 13$$

$$\text{ب) } 2x^2 - x + 2 = 0 \rightarrow \Delta = 1 - 16 \Rightarrow \Delta = -15 \rightarrow \Delta < 0$$

$$\text{ج) } 2x^2 - 4x + 2 = 0 \rightarrow \Delta = 16 - 16 \Rightarrow \Delta = 0 \rightarrow \Delta = 0$$

$$\text{د) } 2x^2 - x + 1 = 0 \rightarrow \Delta = 1 - 8 \Rightarrow \Delta = -7 \rightarrow \Delta < 0$$

$$\text{معادله: } 2x^2 - 3x + a = 0$$

$$\text{الف) } \Delta = 9 - 4a \rightarrow \Delta > 0 \xrightarrow{\text{جای گذاری}} 9 - 4a > 0 \rightarrow 4a < 9$$

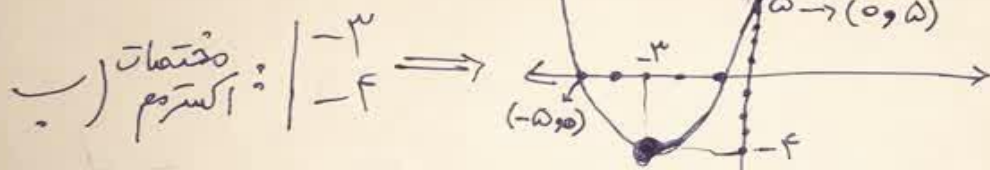
$$\text{ب) } \Delta = 0 \xrightarrow{\text{جای گذاری}} 9 - 4a = 0 \rightarrow 4a = 9 \rightarrow a = \frac{9}{4}$$

$$\text{ج) } \Delta < 0 \xrightarrow{\text{جای گذاری}} 9 - 4a < 0 \rightarrow 4a > 9 \rightarrow a > \frac{9}{4}$$

$$\text{د) } \Delta \geq 0 \xrightarrow{\text{پس}} 9 - 4a \geq 0 \rightarrow a \leq \frac{9}{4}$$

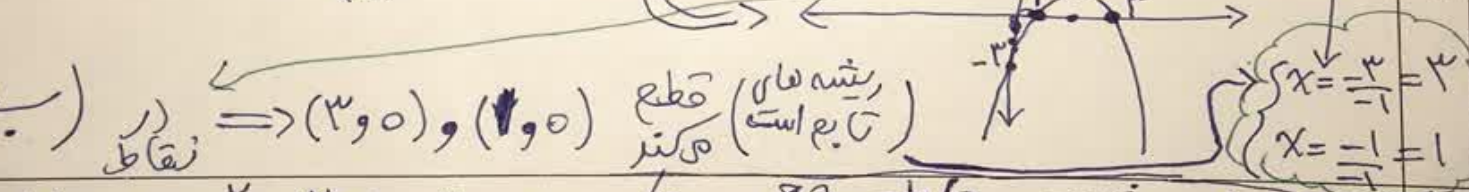
$$\text{مسئله: } y = x^2 + 4x + 5$$

$$\text{الف) } \text{نوع نقطه استرم} \Rightarrow \text{مختصات} \left(\frac{-b}{2a} \right) \Rightarrow \left(-\frac{4}{2} \right) = -2$$



$$\text{مسئله: } y = -x^2 + 4x - 3$$

$$\text{الف) } \text{مختصات استرم} \Rightarrow \left(\frac{-b}{2a} \right) \Rightarrow \left(\frac{4}{-2} \right) = -2$$



$$\text{معادله: } x^2 - 3x - 2 = 0$$

$$\text{الف) } S^2 - 2P \Rightarrow (3)^2 - 2(-2) = 9 + 4 = 13$$

$$\text{ب) } S^3 - 3SP \Rightarrow (3)^3 - 3(3)(-2) = 27 + 18 = 45$$