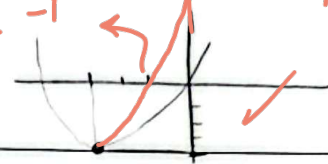


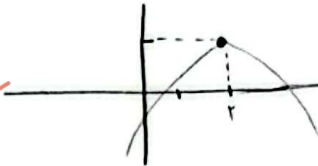
الف) $\min \left| \begin{array}{c} -b \\ 2a \end{array} \right| = \left| \begin{array}{c} -9 \\ 2 \end{array} \right| = -\frac{9}{2} = -4.5$ ✓ $\Delta = b^2 - 4ac$
 $\max \left| \begin{array}{c} -3 \\ -4 \end{array} \right| = -4$ ✓



در نقطه 0

ب)

الف) $\left| \begin{array}{c} -b \\ 2a \end{array} \right| = \max \left| \begin{array}{c} -4 \\ -2 \end{array} \right| = 2$ ✓
 $\left| \begin{array}{c} -\Delta \\ 4a \end{array} \right| = \left| \begin{array}{c} -4 \\ -2 \end{array} \right| = 2$ ✓



الف)

$a + b + c = 0$
 $-1 + 4 - 3 = 0$

$-x^2 + 4x - 3 = 0$

$x = \begin{Bmatrix} 3 \\ 1 \end{Bmatrix}$ ✓ $\begin{bmatrix} 3 \\ 0 \end{bmatrix}$ $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$

ب)

الف) $x = \begin{Bmatrix} 1 \\ 1 \end{Bmatrix}$ $2 - 3 + 1 = 0$ $a = 1$
 $\Delta = b^2 - 4ac = 0$ $9 - (4 \times 2 \times \frac{9}{4}) = 0$ $a = \frac{9}{4}$
 $\Delta \leq 0$ $\wedge a - 9 \geq 0 \Rightarrow \wedge a \geq 9 \Rightarrow a \geq \frac{9}{4}$
 $(a + c = b \quad x = \begin{Bmatrix} -1 \\ \frac{9}{4} \end{Bmatrix} \quad a = -5)$ $a > \frac{9}{4}$ $a \leq \frac{9}{4}$

الف) منظور است حال این است
 ب) به ازای a نامشخص است
 یا فاقد ریشه است نه هر دو ریشه

$a = 2.25$

ج)

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

ب) $x^2 - x - 1 = 0 \Rightarrow x^2 - x + \frac{1}{4} - \frac{5}{4} = 0 \Rightarrow (x - \frac{1}{2})^2 = \frac{5}{4} \Rightarrow x - \frac{1}{2} = \pm\sqrt{\frac{5}{4}}$
 $\Rightarrow x = \begin{Bmatrix} \frac{1+\sqrt{5}}{2} \\ \frac{1-\sqrt{5}}{2} \end{Bmatrix}$ ✓

الف) $x^2 - 2x - 1 = 0$ $\Delta = b^2 - 4ac$ $x = \frac{-b \pm \sqrt{\Delta}}{2a}$
 $4 - (-4) = 8$ $x = \begin{cases} \frac{2 + \sqrt{8}}{2} = 1 + \sqrt{2} \\ \frac{2 - \sqrt{8}}{2} = 1 - \sqrt{2} \end{cases}$

ب) $x^2 + x - 4 = 0$
 $1 - (-14) = 1 + 14 = 15$

$x = \begin{Bmatrix} \frac{-1 + \sqrt{15}}{2} \\ \frac{-1 - \sqrt{15}}{2} \end{Bmatrix}$ ✓

$$x^2 - 11 + 2\lambda = 0$$

$$(x-4)(x-7)=0$$

$$x = \begin{cases} 4 \\ 7 \end{cases}$$

$$x-4=0 \rightarrow x=4$$

$$x-7=0 \rightarrow x=7$$

$$x^2 + 3 - 2\lambda = 0$$

$$(x-4)(x+7)=0$$

$$x-4=0 \rightarrow x=4$$

$$x+7=0 \rightarrow x=-7$$

$$x = \begin{cases} 4 \\ -7 \end{cases}$$

$$5x^2 - 12x + 7 = 0 \Rightarrow x^2 - 12x + 7 \Rightarrow (x-5)(x-7) \Rightarrow x = \begin{cases} \frac{5}{5} = 1 \\ \frac{7}{5} = 1.4 \end{cases}$$

$$3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + 7 \Rightarrow (x-3)(x-7) \Rightarrow x = \begin{cases} \frac{3}{3} = 1 \\ \frac{7}{3} \end{cases}$$

$$\text{الف) } 2x^2 - 5x + 2 = 0 \xrightarrow{\text{مقسوم}} x^2 - 5x + 4 \Rightarrow (x-2)(x-4) \Rightarrow x = \begin{cases} \frac{2}{2} \\ \frac{4}{2} \end{cases}$$

$$\text{ب) } 2x^2 + 5x + 2 = 0 \xrightarrow{\text{مقسوم}} x^2 + 5x + 4 \Rightarrow (x+2)(x+4) \Rightarrow x = \begin{cases} -\frac{2}{2} \\ -\frac{4}{2} \end{cases}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{17}}{4} \Rightarrow x = \begin{cases} \frac{5+\sqrt{17}}{4} \\ \frac{5-\sqrt{17}}{4} \end{cases}$$

$$\Delta = b^2 - 4ac = 25 - (1) = 24$$

$$\text{د) } 4x^2 + 7x + 9 = 0 \quad \Delta = 49 - 144 = -95 \quad (\text{منفی})$$

$$S = \frac{-b}{a} = \frac{7}{1} \quad p = \frac{c}{a} = \frac{-9}{1} = -9$$

$$\text{الف) } S^2 - 2p = 9 - (-18) = 27$$

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

$$\text{الف) } \binom{7}{5} + \binom{9}{2} = \left(\frac{7!}{5! \times 2!} = \frac{7 \times 6 \times 5!}{5! \times 2} = 21 \right) + \left(\frac{9!}{2! \times 7!} = \frac{9 \times 8 \times 7!}{2! \times 7!} = 36 \right)$$

$$\Rightarrow 21 + 36 = 57$$

$$\text{ب) } \binom{9}{3} - \binom{8}{2} = \left(\frac{9!}{3! \times 6!} = \frac{9 \times 8 \times 7 \times 6!}{6! \times 3 \times 2} = 84 \right) - \left(\frac{8!}{2! \times 6!} = \frac{8 \times 7 \times 6!}{2! \times 6!} = 28 \right)$$

$$\Rightarrow 84 - 28 = 56$$