

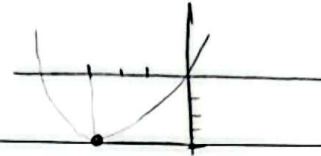
$$\min \left| \begin{array}{c} -b \\ \frac{-\Delta}{\frac{1}{2}a} \end{array} \right| = \left| \begin{array}{c} \frac{-9}{2} = -\frac{9}{2} \\ -\frac{(-9-20)}{2} = -\frac{29}{2} \end{array} \right| = -\frac{9}{2}$$

$$\Delta = b^2 - 4ac$$

$$\max \left| \begin{array}{c} -\frac{9}{2} \\ -\frac{29}{2} \end{array} \right| = -\frac{9}{2}$$

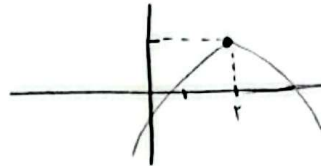
(الف)

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(ب)

$$\left| \begin{array}{c} -b \\ \frac{-\Delta}{\frac{1}{2}a} \end{array} \right| \Rightarrow \max \left| \begin{array}{c} \frac{-4}{-2} = 2 \\ \frac{-4}{-2} = +1 \end{array} \right|$$



(الف)

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$$a+b+c=0 \\ -1+4-9=0$$

$$-x^2+4x-9=0$$

$$x \begin{Bmatrix} 4 \\ 1 \end{Bmatrix}$$

$$\begin{bmatrix} 4 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

(ب)

$$x = \begin{Bmatrix} 1 \\ \frac{1}{2} \end{Bmatrix} \quad 2-9+1=0 \quad a=1$$

(الف)

$$\Delta = b^2 - 4ac = 0 \quad 9 - (4 \times 2 \times \frac{9}{2}) = 0 \quad a = \frac{9}{2}$$

(ب)

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$$\Delta \leq 0 \quad \wedge a-9 \geq 0 \Rightarrow \wedge a \geq 9 \Rightarrow a \geq \frac{9}{2}$$

$$a = 2 \times 10^2$$

(ج)

$$(a+c=b \quad x \begin{Bmatrix} -1 \\ \frac{5}{2} \end{Bmatrix} \quad a=-5)$$

(د)

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

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

$$\text{(الف)} \quad x^2 - 2x - 1 = 0 \quad \Delta = b^2 - 4ac \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} \\ 4 - (-4) = 8$$

$$x = \begin{cases} \frac{2+\sqrt{8}}{2} = 1+\sqrt{2} \\ \frac{2-\sqrt{8}}{2} = 1-\sqrt{2} \end{cases}$$

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$$\text{(ب)} \quad x^2 + x - 4 = 0 \\ 1 - (-14) = 1+14 = 15$$

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

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

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

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

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

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

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

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

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

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

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

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

$$3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + 21 \Rightarrow (x-3)(x-7) \Rightarrow x = \begin{cases} \frac{3}{3} = 1 \\ \frac{7}{3} \end{cases}$$

$$\text{الف) } 2x^2 - 5x + 2 = 0 \xrightarrow{\text{نوس}} x^2 - 5x + 4x \Rightarrow (x-1)(x-4) \Rightarrow x = \begin{cases} \frac{1}{1} \\ \frac{4}{1} \end{cases}$$

$$\text{ب) } 2x^2 + 5x + 2 = 0 \xrightarrow{\text{نوس}} x^2 + 5x + 4 \Rightarrow (x+1)(x+4) \Rightarrow x = \begin{cases} -\frac{1}{1} \\ -\frac{4}{1} \end{cases}$$

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

$$\Delta = b^2 - 4ac = 25 - (1) = 17$$

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

$$S = \frac{-b}{a} = \frac{3}{1} \quad P = \frac{c}{a} = \frac{-2}{1} = -2$$

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

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

$$\text{الف) } \binom{7}{5} + \binom{9}{2} = \left(\frac{7!}{5! \times 2!} = \frac{7 \times 4 \times 3}{5! \times 2} = 21 \right) + \left(\frac{9!}{2! \times 7!} = \frac{9 \times 8 \times 7}{2! \times 7!} = 36 \right)$$

$$\Rightarrow 21 + 36 = 57$$

$$\text{ب) } \binom{9}{3} - \binom{8}{2} = \left(\frac{9!}{3! \times 4!} = \frac{9 \times 8 \times 7 \times 6}{4! \times 3 \times 2} = 84 \right) - \left(\frac{8!}{2! \times 6!} = \frac{8 \times 7 \times 6}{2! \times 6!} = 28 \right)$$

$$\Rightarrow 84 - 28 = 56$$