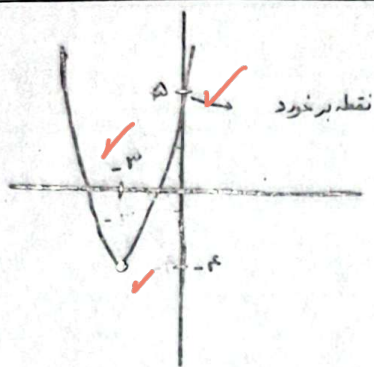




(ب)

$$y = x^2 + 4x + 5 \rightarrow \min$$

(الف)

$$\text{ext} \left| \begin{array}{l} -\frac{b}{2a} = -\frac{4}{2} = -2 \\ -\frac{\Delta}{4a} = \frac{-16}{4} = -4 \end{array} \right. \min \left[\begin{array}{l} -2 \\ -4 \end{array} \right]$$

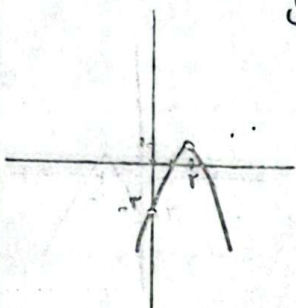
$$\Delta = b^2 - 4ac = 16 - 20 = -4$$

$$0 = -x^2 + 9x - 3$$

$$x = \begin{cases} x = 1 \\ x = \frac{c}{a} = \frac{-3}{-1} = 3 \end{cases}$$

$$\left[\begin{array}{l} 1 \\ 0 \end{array} \right], \left[\begin{array}{l} 3 \\ 0 \end{array} \right] \rightarrow$$

(ب)



$$y = -x^2 + 4x - 3 \rightarrow \max$$

(الف)

$$\text{ext} \left| \begin{array}{l} -\frac{b}{2a} = -\frac{4}{-2} = 2 \\ -\frac{\Delta}{4a} = \frac{-4}{-4} = 1 \end{array} \right. \max \left[\begin{array}{l} 2 \\ 1 \end{array} \right]$$

$$\Delta = b^2 - 4ac = 16 - 12 = 4$$

الف) $2x^2 - 3x + 1 = 0 \rightarrow 2 - 3 + 1 = 0 \Rightarrow x = 1, x = \frac{1}{2} \rightarrow a = 1$

ب) $\Delta = b^2 - 4ac \Rightarrow (-3)^2 - 4ac \geq 0 \Rightarrow 9 - 4ac = 0 \Rightarrow 4ac = 9 \Rightarrow c = \frac{9}{4} \Rightarrow a = \frac{9}{4}$

ج) $\Delta = b^2 - 4ac \Rightarrow 9 - 4ac \geq 0 \Rightarrow c > 2 \Rightarrow a \in \mathbb{R}, a > 2 \Rightarrow a > \frac{9}{4}$

د) $2x^2 - 3x + a = 0 \Rightarrow a \in \mathbb{R}, a \leq 1 \Rightarrow \Delta \geq 0 \rightarrow a \leq \frac{9}{4}$

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

ب) $x^2 - x - 1 = 0 \xrightarrow{+\frac{1}{4}} x^2 - x + \frac{1}{4} = 1\frac{1}{4} \Rightarrow (x - \frac{1}{2})^2 = \frac{5}{4} \Rightarrow x - \frac{1}{2} = \pm \sqrt{\frac{5}{4}} \Rightarrow x = \frac{1}{2} + \frac{\sqrt{5}}{2} \text{ و } x = \frac{1}{2} - \frac{\sqrt{5}}{2}$

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

ب) $\Delta = b^2 - 4ac \Rightarrow \Delta = 1 - 4(-1) = 1 + 4 = 5 \Rightarrow x = \frac{-1 \pm \sqrt{5}}{2} = \begin{cases} \frac{-1 + \sqrt{5}}{2} \\ \frac{-1 - \sqrt{5}}{2} \end{cases}$

$$\text{الف) } x^2 - 11x + 18 = 0 \Rightarrow (x - f)(x - v) \Rightarrow x \begin{cases} = v \\ = f \end{cases}$$

$$\text{ب) } x^2 + 3x - 18 = 0 \Rightarrow (x + v)(x - f) \begin{cases} = -v \\ = f \end{cases}$$

$$\text{الف) } 2x^2 - 12x + 5 = 0 \rightarrow x^2 - 6x + 2.5 = 0 \Rightarrow (x - v)(x - \frac{v}{2}) \Rightarrow x \begin{cases} = \frac{v}{2} \\ = \frac{v}{2} = 1 \end{cases}$$

$$\text{ب) } 3x^2 - 10x + 5 = 0 \rightarrow x^2 - 10x + 11 = 0 \Rightarrow (x - 3)(x - v) \Rightarrow x \begin{cases} = \frac{r}{v} = 1 \\ = x \frac{v}{v} \end{cases}$$

$$\text{الف) } a + b + c = 0 \begin{cases} x = 1 \\ x = \frac{c}{a} = \frac{r}{v} \end{cases}$$

$$\text{ب) } a + c = b \begin{cases} x = -1 \\ x = -\frac{c}{a} = -\frac{r}{v} \end{cases}$$

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

$$\text{د) } 4x^2 + 4x + 9 = 0 \Rightarrow \Delta = 4^2 - 4 \cdot 4 \cdot 9 = -92 < 0 \Rightarrow \text{لا يوجد حقيقي}$$

(ب)

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

(الف)

$$P = \frac{c}{a} = \frac{-r}{1} = -r$$

$$S^2 - rSp = r^2 - (-11) = 2v + 11 = 12$$

$$S^2 - rP = r^2 - r(-r) = 9 - (-4) = 13$$

$$\text{الف) } \binom{v}{2} + \binom{9}{2} = \frac{v!}{(v-2)! 2!} + \frac{9!}{(9-2)! 2!} = \frac{v \times (v-1)}{2 \times 1} + \frac{9 \times 8}{2 \times 1} = 21 + 36 = 57$$

$$\text{ب) } \binom{9}{3} - \binom{1}{2} = \frac{9!}{(9-3)! 3!} - \frac{1!}{(1-2)! 2!} = \frac{9 \times 8 \times 7}{3 \times 2 \times 1} - \frac{1 \times 1}{1 \times 1} = 84 - 1 = 83$$