

(ب)

$$x = \frac{-b}{2a} = \frac{-4}{2} = -2, y = 9 - 18 + 5 = (-4)$$

$$\begin{vmatrix} -2 \\ -4 \end{vmatrix}$$

$$a > 0 \rightarrow \min$$

(الف)

1

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

$$\textcircled{1} x^2 - 4x + 3 = 0 \rightarrow (x-1)(x-3) = 0$$

$$\textcircled{2} a+b+c = 0 \rightarrow 1+4+3 = 8 \neq 0 \quad x = 1 \text{ یا } 3$$

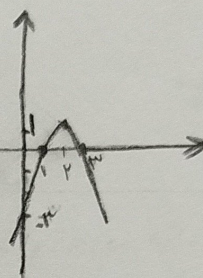
$$\begin{vmatrix} 1 & 4 & 3 \\ 0 & 0 & 0 \end{vmatrix}$$

(ب)

$$x = \frac{-b}{2a} = \frac{-4}{-2} = 2, y = -4 + 16 - 3 = 9$$

$$\text{ext: } \begin{vmatrix} 2 \\ 9 \end{vmatrix}$$

$$a < 0 \rightarrow \max$$



(الف)

2

$$\Delta = 0 \rightarrow b^2 - 4ac = 0 \rightarrow 9 - 12a = 0 \rightarrow a = \frac{3}{4}$$

(ب)

$$\Delta > 0 \rightarrow 9 - 12a > 0 \rightarrow a < \frac{3}{4}$$

(الف)

$$\Delta > 0 \rightarrow b^2 - 4ac > 0 \rightarrow 9 - 12a > 0 \rightarrow a < \frac{3}{4}$$

(ب)

$$\Delta < 0 \rightarrow b^2 - 4ac < 0 \rightarrow 9 - 12a < 0 \rightarrow a > \frac{3}{4}$$

(2)

3

$$\text{الف) } x^2 - 2x - 1 = 0 \rightarrow x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2 \rightarrow x = 1 \pm \sqrt{2}$$

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

4

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

$$\text{ب) } x^2 + x - 4 = 0 \rightarrow \Delta = b^2 - 4ac = 1 + 16 = 17 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{17}}{2}$$

5

$$\text{الف) } x^2 - 11x + 28 = 0 \rightarrow (x-4)(x-7) = 0 \rightarrow x = 4 \text{ و } 7$$

$$\text{ب) } x^2 + 2x - 21 = 0 \rightarrow (x+7)(x-3) = 0 \rightarrow x = -7 \text{ و } 3$$

$$\text{الف) } 5x^2 - 12x + 7 = 0 \rightarrow x^2 - 12x + 35 = 0 \rightarrow (x-5)(x-7) = 0 \rightarrow x = 5 \text{ و } 7 \Rightarrow x = 1 \frac{5}{7} \frac{7}{5}$$

$$\text{ب) } 3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 = 0 \rightarrow (x-3)(x-7) = 0 \rightarrow x = 3 \text{ و } 7 \Rightarrow x = 1 \frac{3}{7} \frac{7}{3}$$

$$\text{الف) } 2x^2 - 5x + 3 = 0 \rightarrow x^2 - 5x + 4 = 0 \rightarrow (x-2)(x-3) = 0 \rightarrow x = 2 \text{ و } 3 \Rightarrow x = 1 \frac{2}{3} \frac{3}{2} \quad \left\{ \begin{array}{l} \text{جمع ضرائب} = 0 \rightarrow 1 \frac{2}{3} \frac{3}{2} = \frac{3}{2} \end{array} \right.$$

$$\text{ب) } 2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 4 = 0 \rightarrow (x+2)(x+3) = 0 \rightarrow x = -2 \text{ و } -3 \Rightarrow x = -1 \frac{2}{3} \frac{3}{2} \quad \left\{ \begin{array}{l} a+c=b \rightarrow -1 \frac{2}{3} \frac{3}{2} = \frac{3}{2} \end{array} \right.$$

$$\text{ج) } 2x^2 - 5x + 1 = 0 \rightarrow \Delta = b^2 - 4ac = 25 - 4 = 21 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{21}}{4}$$

$$\text{د) } 4x^2 + 7x + 4 = 0 \rightarrow \Delta = b^2 - 4ac = 49 - 64 = -15 \rightarrow \Delta < 0 \rightarrow \text{جواب ندارد}$$

$$x^2 - 3x - 2 = 0 \rightarrow \Delta = b^2 - 4ac = 9 + 8 = 17 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{3 \pm \sqrt{17}}{2} \Rightarrow S = \frac{3 + \sqrt{17}}{2} + \frac{3 - \sqrt{17}}{2} = 3 \quad P = \frac{(3 + \sqrt{17})(3 - \sqrt{17})}{4} = -\frac{5}{4}$$

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

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

$$\text{الف) } \binom{7}{5} + \binom{9}{2} = \frac{7!}{5! \times 2!} + \frac{9!}{2! \times 7!} = 21 + 36 = 57$$

$$\text{ب) } \binom{9}{3} - \binom{11}{2} = \frac{9!}{3! \times 6!} - \frac{11!}{2! \times 9!} = 84 - 55 = 29$$