

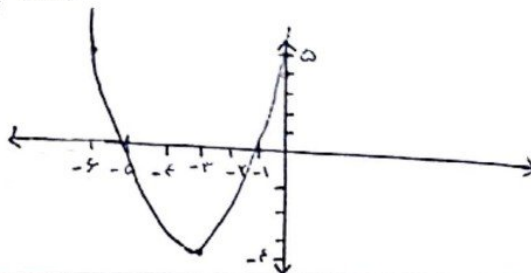
$$y = x^2 + 4x + 5 \quad a > 0 \rightarrow \min \quad \text{ext} \quad \left| \begin{array}{l} -\frac{b}{2a} = \frac{-4}{2} = -2 \\ -\frac{\Delta}{4a} = \frac{-16}{4} = -4 \end{array} \right.$$

$$\Delta = b^2 - 4ac = 16 - 4(1)(5) = 36 - 20 = 16$$

$$x^2 + 4x + 5 = 0$$

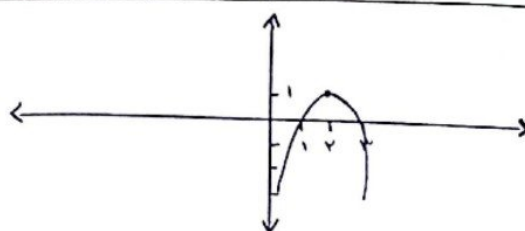
$$a + c = b \rightarrow x_1 = -1$$

$$a + c = b \rightarrow x_2 = -\frac{c}{a} = -\frac{5}{1} = -5$$



$$y = -x^2 + 4x - 3 \quad \text{ext} \quad \left| \begin{array}{l} -\frac{b}{2a} = \frac{-4}{-2} = 2 \\ -\frac{\Delta}{4a} = \frac{-4}{-4} = 1 \end{array} \right.$$

$$\Delta = b^2 - 4ac = 16 - 4(-1)(-3) = 16 - 12 = 4$$



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

$$a + b + c = 0 \rightarrow x_1 = 1, x_2 = \frac{c}{a} = \frac{-3}{-1} = 3$$

ب) نقاط 1 و 3

$$\Delta > 0 \rightarrow b^2 - 4ac > 0 \rightarrow 16 - 4(-1)(a) > 0 \rightarrow 16 + 4a > 0 \rightarrow 4a > -16 \rightarrow a > -4$$

$$\Delta = 0 \rightarrow b^2 - 4ac = 0 \rightarrow 16 + 4a = 0 \rightarrow 4a = -16 \rightarrow a = -4$$

$$\Delta < 0 \rightarrow b^2 - 4ac < 0 \rightarrow 16 + 4a < 0 \rightarrow 4a < -16 \rightarrow a < -4$$

$$\Delta \geq 0 \rightarrow 16 + 4a \geq 0 \rightarrow 4a \geq -16 \rightarrow a \geq -4$$

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

$$x_1 = \sqrt{2} + 1$$

$$x_2 = -\sqrt{2} + 1$$

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

$$x - \frac{1}{2} = \pm \frac{\sqrt{5}}{2} \rightarrow x_1 = \frac{1 + \sqrt{5}}{2}$$

$$\rightarrow x_2 = \frac{1 - \sqrt{5}}{2}$$

$$\text{الف) } x^2 - 2x - 1 = 0$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x_1 = \frac{2 + \sqrt{8}}{2} = \frac{2 + 2\sqrt{2}}{2} = 1 + \sqrt{2}$$

$$\rightarrow x_2 = \frac{2 - \sqrt{8}}{2} = \frac{2 - 2\sqrt{2}}{2} = 1 - \sqrt{2}$$

$$\Delta = b^2 - 4ac = 4 - 4(1)(-1) = 4 + 4 = 8$$

$$\text{ب) } x^2 + x - 4 = 0$$

$$\Delta = b^2 - 4ac = 1 - 4(1)(-4) = 1 + 16 = 17$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$x_1 = \frac{-1 + \sqrt{17}}{2}$$

$$x_2 = \frac{-1 - \sqrt{17}}{2}$$

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

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

$$\text{ب) } x^2 + 3x - 28 = 0 \rightarrow (x+7)(x-4) = 0 \rightarrow x+7=0 \rightarrow x=-7$$

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

$$\text{الف) } \Delta x^2 - 12x + 4 = 0 \rightarrow x^2 - 12x + 4 = 0 \rightarrow (x-6)(x-2) = 0 \rightarrow x = \frac{6}{1} = 6$$

$$\rightarrow x = \frac{2}{1} = 2$$

$$\text{ب) } 3x^2 - 10x + 4 = 0 \rightarrow x^2 - 10x + 4 = 0 \rightarrow (x-2)(x-8) = 0 \rightarrow x = \frac{2}{1} = 2$$

$$\rightarrow x = \frac{8}{1} = 8$$

$$\text{الف) } 2x^2 - 5x + 3 = 0$$

$$a+b+c=0 \rightarrow x_1 = 1$$

$$\rightarrow x_2 = \frac{c}{a} = \frac{3}{2}$$

$$\text{ب) } 2x^2 + 5x + 3 = 0$$

$$a+c=b \rightarrow x_1 = -1$$

$$\rightarrow x_2 = -\frac{c}{a} = -\frac{3}{2}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0$$

$$\Delta = b^2 - 4ac = 25 - 4(2)(1) = 25 - 8 = 17$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x_1 = \frac{5 + \sqrt{17}}{4}$$

$$\rightarrow x_2 = \frac{5 - \sqrt{17}}{4}$$

$$\text{د) } x^2 + 7x + 9 = 0$$

$$\Delta = b^2 - 4ac = 49 - 4(1)(9) = 49 - 36 = 13 < 0 \rightarrow \Delta < 0$$

$\Delta < 0 \rightarrow$ ناترین حقیقی

$$S = -\frac{b}{a} = \frac{5}{1} = 5$$

$$P = \frac{c}{a} = \frac{-9}{1} = -9$$

$$\text{الف) } S^2 - 2P = 25 + 18 = 43$$

$$\text{ب) } S^2 - 3SP = 25 - 3(5)(-9) = 25 + 135 = 160$$

$$\text{الف) } \begin{pmatrix} 1 \\ 2 \end{pmatrix} + \begin{pmatrix} 3 \\ 4 \end{pmatrix} = \begin{pmatrix} 1+3 \\ 2+4 \end{pmatrix} = \begin{pmatrix} 4 \\ 6 \end{pmatrix} = 2 \times 2 = 4$$

برای $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$ است

$$\text{ب) } \begin{pmatrix} 3 \\ 4 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \begin{pmatrix} 3-1 \\ 4-2 \end{pmatrix} = \begin{pmatrix} 2 \\ 2 \end{pmatrix} = 1 \times 2 = 2$$