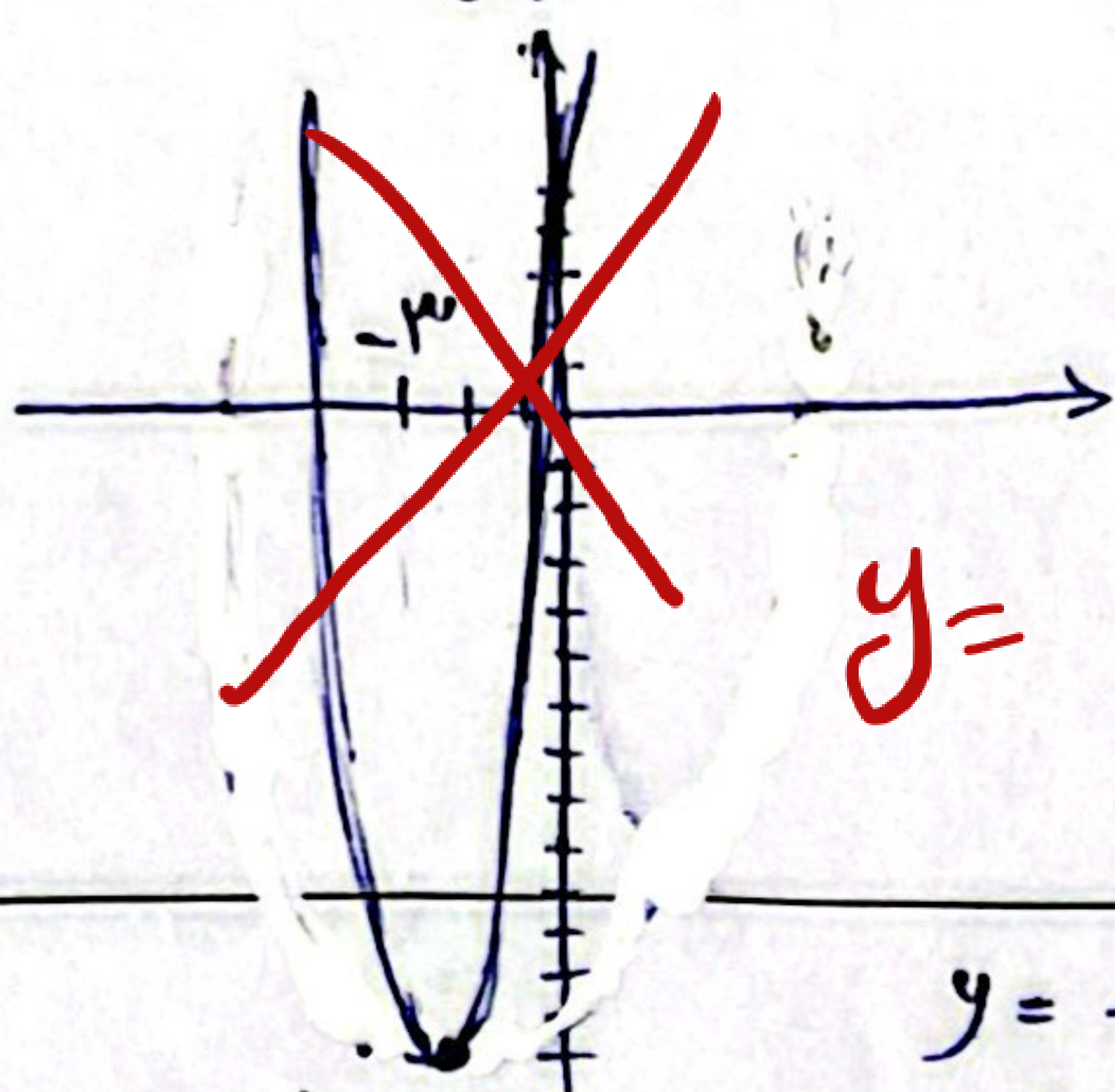


$$y = x^2 + 4x + 5$$

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

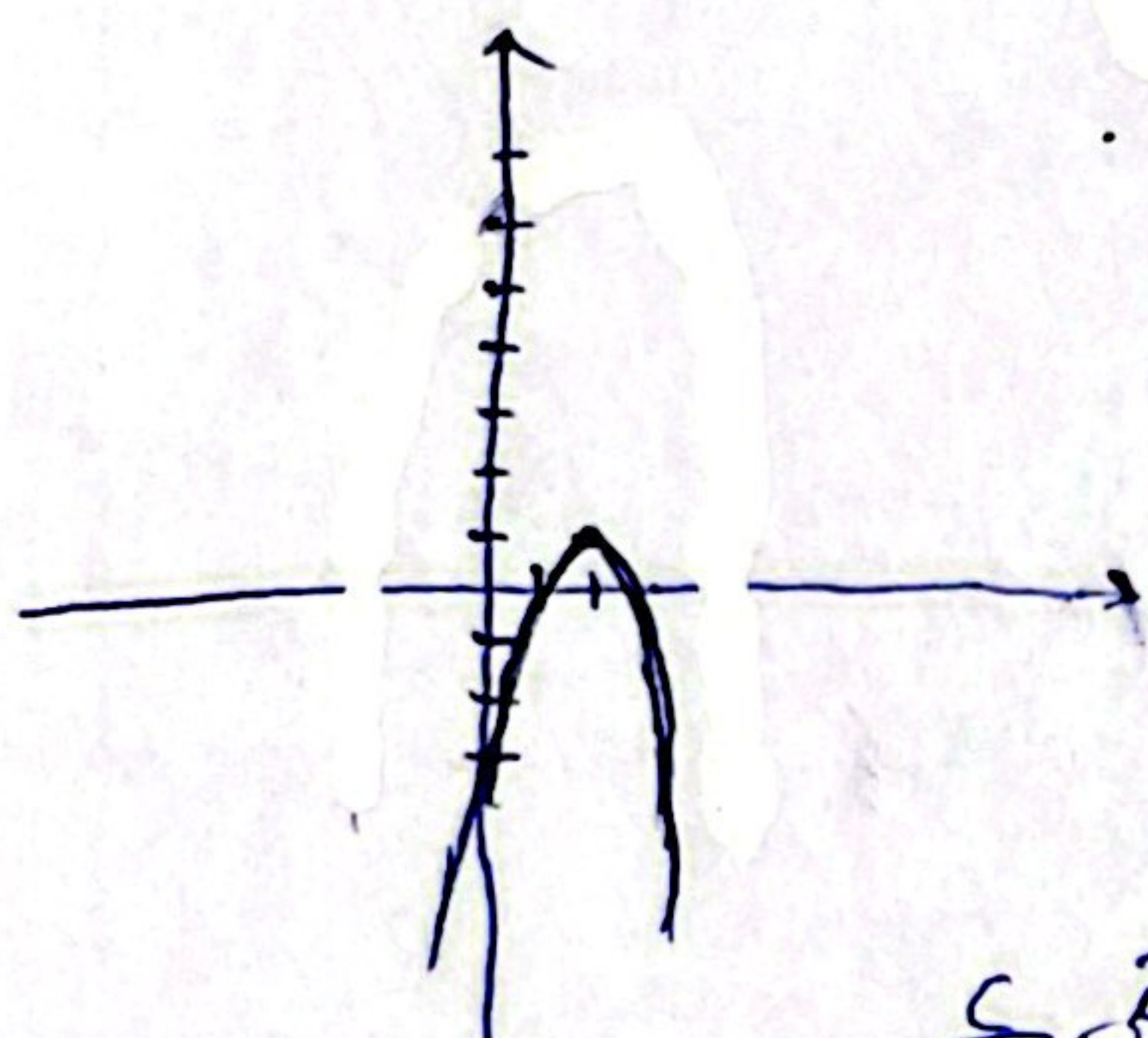
$$a > 0 \rightarrow \min U$$



$$\text{ext} \left| \begin{array}{l} \frac{-b}{2a} = \frac{-4}{2} = -2 \\ \frac{-\Delta}{4a} = \frac{-(-4)}{4} = 1 \end{array} \right. \quad \text{(الف)}$$

$$x = -2$$

$$y = (-2)^2 + 4(-2) + 5 = -1$$



$$y = -x^2 + 4x - 3 \rightarrow a < 0 \rightarrow \max \text{ ext} \left| \begin{array}{l} \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ \frac{-\Delta}{4a} = \frac{-(-4)}{-4} = -1 \end{array} \right. \quad \text{(الف)}$$

$$a + b + c = 0$$

سرسینه های اینجایی ۱ و ۳ →

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

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

$$9 - 12a = 0$$

$$\frac{12a}{12} = \frac{9}{12}$$

$$a = \frac{3}{4}$$

$$9 - 12a > 0 \quad \text{(الف)}$$

$$-12a > -9$$

$$\frac{12a}{12} < \frac{9}{12}$$

$$a < \frac{3}{4}$$

$$\text{ج) } 9 - 12a < 0$$

$$-12a < -9$$

$$\frac{12a}{12} > \frac{9}{12}$$

$$a > \frac{3}{4}$$

$$a < \frac{3}{4} \leftarrow \Delta > 0 \quad \text{(الف)}$$

$$a = \frac{3}{4} \leftarrow \Delta = 0 \quad \text{(ب)}$$

$$a > \frac{3}{4} \leftarrow \Delta < 0 \quad \text{(ج)}$$

$$\{a | a \in \mathbb{R}, a < \frac{3}{4}\}$$

$$\text{الف) } (x^2 - 2x - 1)^2 = 0$$

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

$$x = 1 \pm \sqrt{2}$$

$$\text{ب) } [x^2 - x - 1 = 0]^2$$

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

$$x - \frac{1}{x} = \pm\sqrt{\frac{5}{x}}$$

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

$$\text{الف) } x^2 - 2x - 1 = 0$$

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

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2}$$

$$\frac{x(1+\sqrt{2})}{x} = \frac{2+2\sqrt{2}}{2} = 1+\sqrt{2}$$

$$\frac{x(1-\sqrt{2})}{x} = \frac{2-2\sqrt{2}}{2} = 1-\sqrt{2}$$

$$\text{ب) } x^2 + x - 1 = 0$$

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

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

$$\frac{-1+\sqrt{5}}{2}$$

$$\frac{-1-\sqrt{5}}{2}$$

$$\text{الف) } x^2 - 11x + 21 = 0$$

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

$$x = 4$$

$$x = 7$$

$$\text{ب) } x^2 + 3x - 21 = 0$$

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

$$x = 4$$

$$x = -7$$

$$\text{الف) } \omega x^2 - 12x + 7 = 0$$

$$x^2 - 12x + 7\omega = 0$$

$$(x-7)(x-\omega) = 0 \rightarrow x = \frac{7}{\omega} \text{ , } x = \frac{\omega}{\omega} = 1$$

$$\text{ب) } 3x^2 - 10x + 7 = 0$$

$$x^2 - 10x + 21 = 0$$

$$(x-3)(x-7) = 0 \rightarrow x = \frac{3}{3} = 1 \text{ , } x = \frac{7}{3}$$

$$\text{الف) } 2x^2 - 5x + 3 = 0 \rightarrow x = 1$$

$$x = \frac{c}{a} = \frac{3}{2}$$

$$\text{ب) } 2x^2 + 5x + 3 = 0$$

$$x = -1 \text{ , } x = -\frac{c}{a} = -\frac{3}{2}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0$$

$$\Delta = b^2 - 4ac = 25 - 8 = 17 \quad x = \frac{5 \pm \sqrt{17}}{4}$$

$$\text{د) } 4x^2 + 7x + 9 = 0 \quad \Delta = b^2 - 4ac = 49 - 144 = -95 \rightarrow \Delta < 0 \text{ معادلة حوا ندارد}$$

$$S = \frac{-b}{a} = 3$$

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

$$P = \frac{c}{a} = -2$$

$$\text{الف) } \left(\frac{-3}{1}\right)^2 - 2\left(\frac{-2}{1}\right) = 9 - (-4) = 13$$

$$\text{ب) } 3^3 - 3 \times 3 \times (-2) = 27 + 12 = 39$$

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

$$7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$$

$$9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 362880$$

$$\text{ب) } \binom{9}{3} - \binom{1}{1} = 84 - 1 = 83$$

$$\frac{9 \times 8 \times 7}{1 \times 2 \times 3} = 84$$

$$\frac{1 \times 1}{1 \times 1} = 1$$