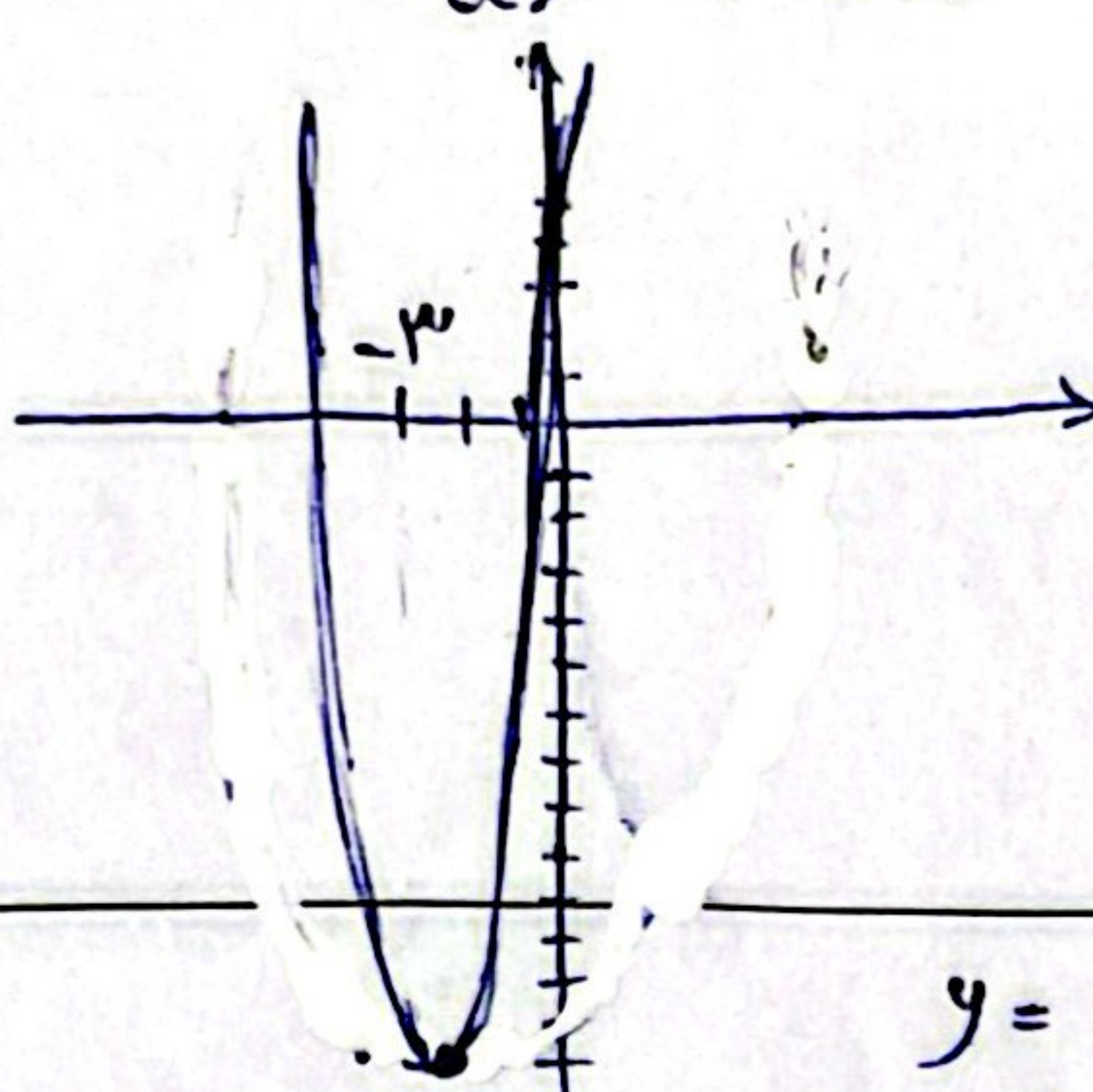
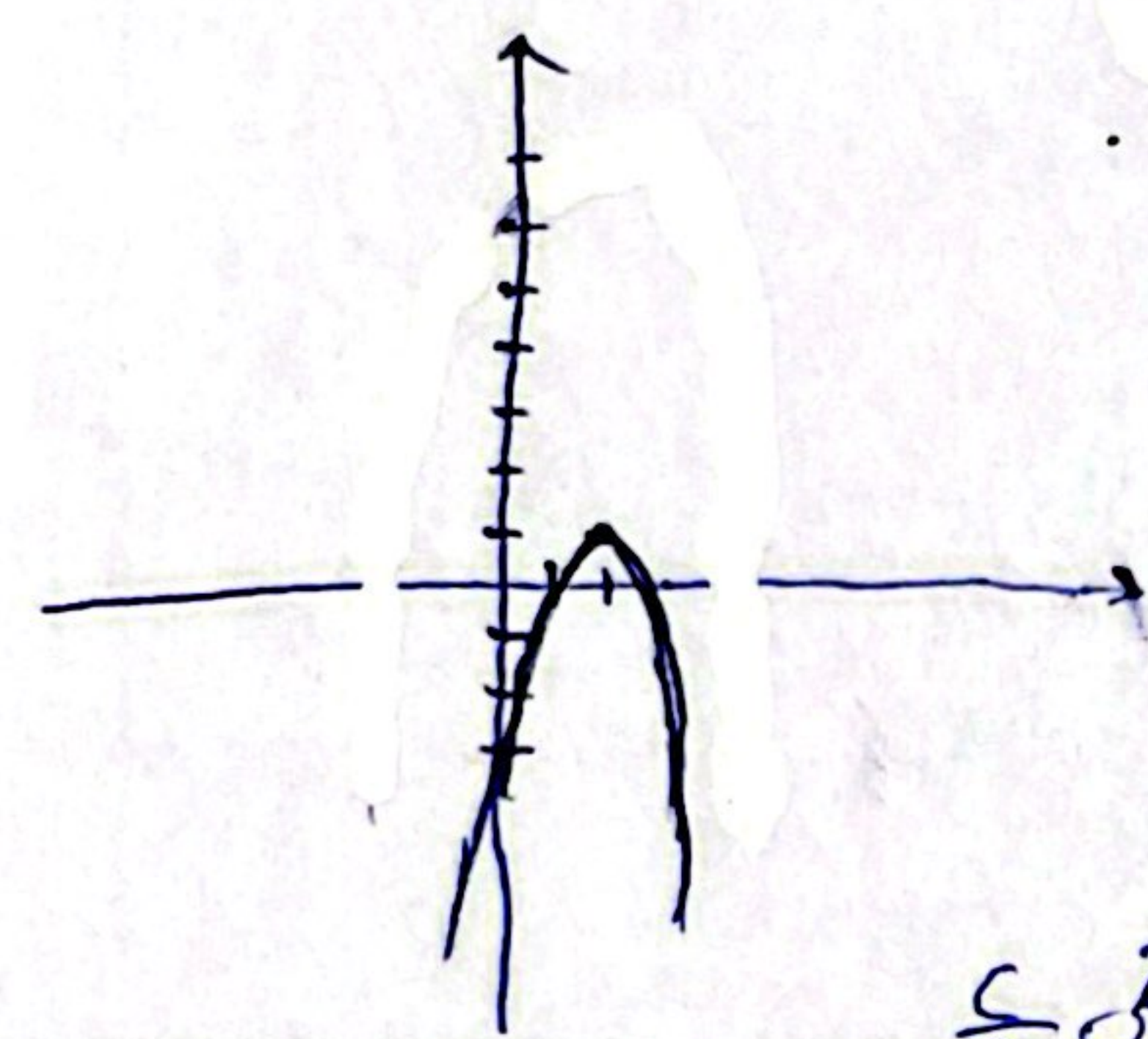


$y = x^2 + 4x + 5$
 $\Delta = b^2 - 4ac$
 $a > 0 \rightarrow \min U$
 $\text{ext} \left| \begin{array}{l} -\frac{b}{2a} = -\frac{4}{2} = -2 \\ -\frac{\Delta}{4a} = \frac{-16 - 4(1 \times 5)}{4} = \frac{-36}{4} = -9 \end{array} \right.$ (الف)
 (ب)

$y = -x^2 + 4x - 3 \rightarrow a < 0 \rightarrow \max$
 $\text{ext} \left| \begin{array}{l} -\frac{b}{2a} = -\frac{4}{-2} = 2 \\ -\frac{\Delta}{4a} = \frac{-16 - 4(1 \times -3)}{-4} = \frac{-4}{-4} = 1 \end{array} \right.$ (الف)
 (ب)
 $a + b + c = 0$
 پس ریشه های این معادله ۱ و ۳

$2x^2 - 3x + a = 0$
 $\Delta = b^2 - 4ac$
 $9 - 12a = 0$
 $12a = 9$
 $a = \frac{3}{4}$
 الف) $9 - 12a > 0$
 $-12a > -9$
 $\frac{12a}{12} < \frac{9}{12}$
 $a < \frac{3}{4}$
 ب) $a = \frac{3}{4} \rightarrow \Delta = 0$
 ج) $9 - 12a < 0$
 $-12a < -9$
 $\frac{12a}{12} > \frac{9}{12}$
 $a > \frac{3}{4}$
 $\{a | a \in \mathbb{R}, a < \frac{3}{4}\}$

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

الف) $x^2 - 2x - 1 = 0$
 $\Delta = b^2 - 4ac = 4 - 4(1 \times -1) = 8$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2}$
 ب) $x^2 + x - 1 = 0$
 $\Delta = b^2 - 4ac = 1 - 4(1 \times -1) = 5$
 $x = \frac{-1 \pm \sqrt{5}}{2}$

$$\text{الف) } x^2 - 11x + 21 = 0$$

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

$$x = 4$$

$$x = 7$$

$$\text{ب) } x^2 + 3x - 21 = 0$$

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

$$x = 4$$

$$x = -7$$

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

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

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

$$\text{ب) } 3x^2 - 10x + 7 = 0$$

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

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

$$\text{الف) } 2x^2 - 8x + 3 = 0 \rightarrow x = 1$$

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

$$\text{ب) } 2x^2 + 5x + 3 = 0$$

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

$$\text{ج) } 2x^2 - 8x + 1 = 0$$

$$\Delta = b^2 - 4ac = 64 - 8 = 56 \quad x = \frac{8 \pm \sqrt{56}}{4}$$

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

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

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

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

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

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

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

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

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

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

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

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