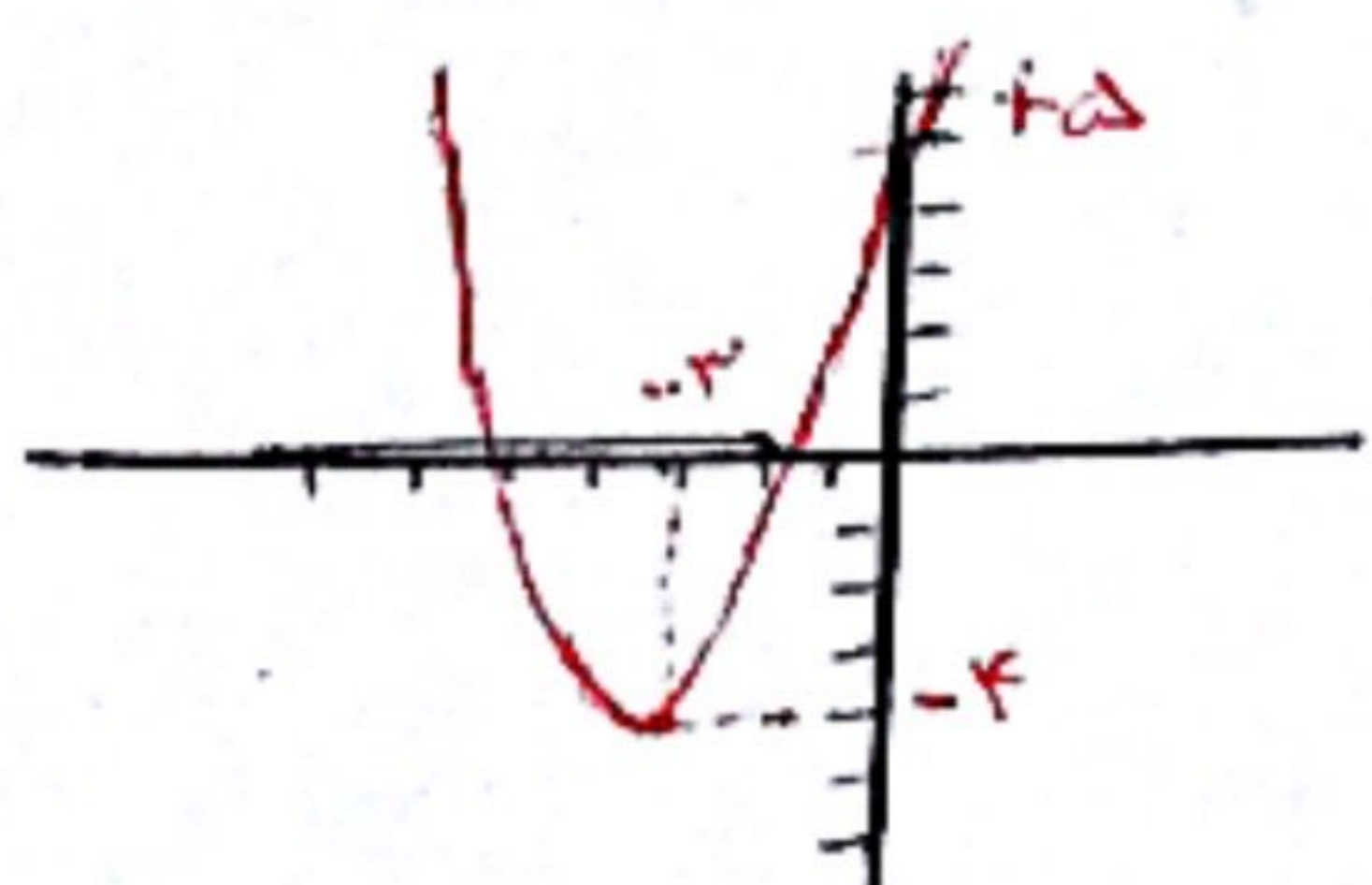
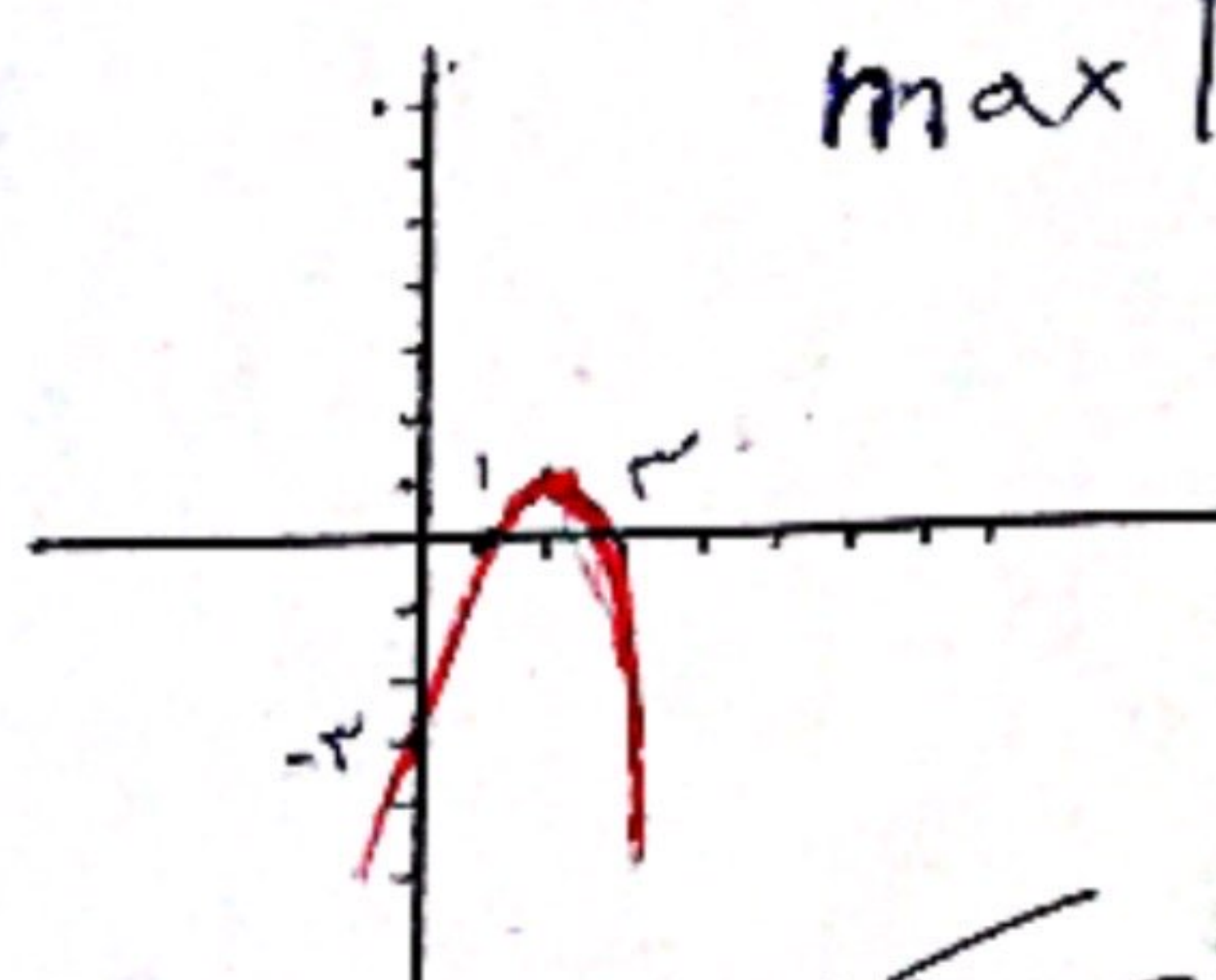


الف) $a > 0$ پس سهمی min دارد است
 $\min \left| \frac{-b}{2a} \Rightarrow y = x^2 + 6x + 5 \rightarrow \frac{-6}{2} = -3 \right. \Rightarrow \min | -4$
 $y \Rightarrow y = x^2 + 6x + 5 \rightarrow y = 9 + 6(-3) + 5 = -4$



(ب)

الف) $a < 0$ پس سهمی max دارد
 $\max \left| \frac{-b}{2a} \Rightarrow y = -x^2 + 4x - 3 \rightarrow \frac{-4}{-2} = 2 \right. \Rightarrow \max | 1$
 $y \rightarrow y = -(2)^2 + 4(2) - 3 = 1$



(ب)

دو نقطه $\{0\}$ و $\{1\}$ را قطع می کند
 $-x^2 + 4x - 3 = 0 \Rightarrow (x-1)(-x+3) = 0 \Rightarrow x=1, x=3$

الف) باید دلتا مثبت باشد $\Delta > 0 \Rightarrow 1 > 0$
 $b^2 - 4ac \rightarrow (-3)^2 - 1a = 9 - 1a \Rightarrow 9 - 1a > 0 \Rightarrow a < 9$

ب) دلتا باید مساوی صفر باشد $\Delta = 0$
 $b^2 - 4ac \rightarrow (-3)^2 - 1a = 9 - 1a \Rightarrow 9 - 1a = 0 \Rightarrow a = 9$

ج) دلتا باید منفی باشد $\Delta < 0$
 $b^2 - 4ac \rightarrow (-3)^2 - 1a = 9 - 1a \Rightarrow 9 - 1a < 0 \Rightarrow a > 9$

د) دلتا باید منفی نباشد $\Delta \geq 0$
 $b^2 - 4ac \rightarrow (-3)^2 - 1a = 9 - 1a \Rightarrow 9 - 1a \geq 0 \Rightarrow a \leq 9$

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

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

الف) $x^2 - 2x - 1 = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow \Delta = (-2)^2 - 4(-1) = 12 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x = \frac{2 \pm \sqrt{12}}{2} = 1 \pm \sqrt{3}$

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

الف) $x^2 - 2x - 1 = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow \Delta = (-2)^2 - 4(-1) = 12 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x = \frac{2 \pm \sqrt{12}}{2} = 1 \pm \sqrt{3}$

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$$x^2 - 11x + 18 = 0 \Rightarrow (x-4)(x-7) = 0 \rightarrow x < \begin{matrix} 4 \\ 7 \end{matrix}$$

الف)

$$x^2 + 3x - 11 = 0 \Rightarrow (x-4)(x+7) = 0 \rightarrow x < \begin{matrix} -7 \\ 4 \end{matrix}$$

ب)

ج)

الف) $\omega x^2 - 12x + 7 = 0 \rightarrow x^2 - 12x + 7\omega = 0 \Rightarrow (x-7)(x-\omega) = 0 \Rightarrow x < \begin{matrix} 7 \\ \omega \end{matrix}$

ب)

$$\rightarrow x < \begin{matrix} \frac{7}{\omega} = 1.4 \\ \omega = 1 \end{matrix}$$

ب) $\mu x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 7\mu = 0 \Rightarrow (x-7)(x-3) = 0 \Rightarrow x < \begin{matrix} 7 \\ 3 \end{matrix}$

$$\rightarrow x < \begin{matrix} \frac{7}{\mu} \\ 3 \end{matrix}$$

الف) $\gamma x^2 - \omega x + 7 = 0 \rightarrow x^2 - \omega x + 7\gamma = 0 \Rightarrow (x-7)(x-3) = 0 \rightarrow x < \begin{matrix} 7 \\ 3 \end{matrix} \rightarrow x < \begin{matrix} \frac{7}{\gamma} + 1 \\ \frac{3}{\gamma} = 1.5 \end{matrix}$

ب) $\gamma x^2 + \omega x + 7 = 0 \rightarrow x^2 + \omega x + 7\gamma = 0 \Rightarrow (x+7)(x+3) = 0 \rightarrow x < \begin{matrix} -7 \\ -3 \end{matrix} \rightarrow x < \begin{matrix} -\frac{7}{\gamma} = -1 \\ -\frac{3}{\gamma} = -1.5 \end{matrix}$

ج) $\gamma x^2 - \omega x + 1 = 0 \rightarrow \Delta = 4\omega - 4(7) = 17 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x = \frac{\omega \pm \sqrt{17}}{7}$

ب)

د) $\gamma x^2 + 7x + 9 = 0 \rightarrow \Delta = 49 - 4(7)(9) = 49 - 144 \Rightarrow$ دلتا منفی است
ریشه حقیقی ندارد

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

حاصل جمع ریشه ها: $-\frac{b}{a}$
حاصل ضرب ریشه ها: $\frac{c}{a}$

$$S = -\frac{b}{a} = -\frac{(-3)}{1} = 3$$

$$P = \frac{c}{a} = \frac{-2}{1} = -2$$

$$S^2 - 2P = 9 - (-4) = 13$$

$$S^2 - 2SP = 2V - (-11) = 4\omega$$

ب)

$$\binom{V}{\omega} + \binom{9}{7} = \frac{V!}{\omega! 7!} + \frac{9!}{7! 2!} = \frac{V \times \cancel{7!} \times \cancel{7!}}{\cancel{7!} \times \cancel{7!} \times 1} + \frac{9 \times \cancel{7!} \times \cancel{7!}}{\cancel{7!} \times \cancel{7!} \times 1} = 21 + 126 = 147$$

ب)

$$\binom{9}{7} - \binom{1}{2} = \frac{9!}{7! 2!} - \frac{1!}{2! 1!} = \frac{9 \times \cancel{7!} \times \cancel{7!}}{\cancel{7!} \times \cancel{7!} \times 1} - \frac{1 \times \cancel{2!} \times \cancel{2!}}{\cancel{2!} \times \cancel{2!} \times 1} = 144 - 21 = 123$$