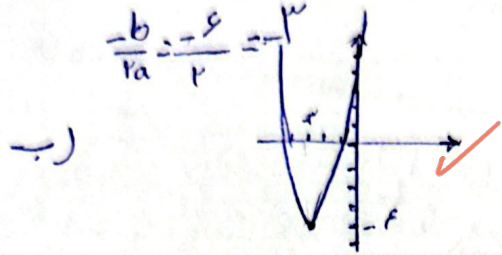
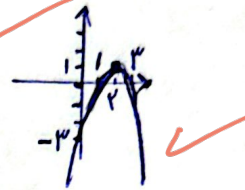


الف) $\text{ext} \left| \frac{-b}{2a} \rightarrow \min \right| \frac{-3}{-4} \checkmark \quad y = 4 + (-1) + 1 \rightarrow y = -4 \checkmark$



الف) $\text{ext} \left| \frac{-b}{2a} \rightarrow \max \right| \frac{1}{-4} \checkmark \quad y = -4 + 1 - 3 = -6 \checkmark$
 $\frac{-b}{2a} = \frac{-1}{-4} = \frac{1}{4}$



ب) $0 = -x^2 + 4x - 3$
 $x^2 - 4x + 3 = 0 \rightarrow (x-3)(x-1) = 0$
 $x \rightarrow 1 \text{ و } 3$
 محور x ها را در نقاط ۳ و ۱ قطع می‌کند

الف) $\Delta > 0 \quad 4 - 1a > 0 \rightarrow -1a > -4 \rightarrow 1a < 4 \rightarrow a < \frac{4}{1} \checkmark$
 $\Delta = b^2 - 4ac = 4 - (4 \times 1 \times a) = 4 - 1a \checkmark$

ب) $\Delta = 0 \quad 4 - 1a = 0 \rightarrow -1a = -4 \rightarrow 1a = 4 \rightarrow a = \frac{4}{1}$

ج) $\Delta < 0 \quad \frac{4-1a}{4} < 0 \rightarrow 4 - 1a < 0 \rightarrow -1a < -4 \rightarrow 1a > 4 \rightarrow a > \frac{4}{1}$

د) $\Delta \geq 0 \quad 4 - 1a \geq 0 \rightarrow -1a \geq -4 \rightarrow 1a \leq 4 \rightarrow a \leq \frac{4}{1}$

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

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

الف) $x^2 - 2x - 1 = 0 \quad \Delta = b^2 - 4ac = 4 - (4 \times 1 \times -1) = 4 + 4 = 8 \checkmark$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = \frac{2(1 \pm \sqrt{2})}{2} = 1 \pm \sqrt{2}$
 $(1 \pm \sqrt{2}) \leftarrow \text{ریشه ها}$

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

$$\text{الف)} \quad x^2 - 11x + 18 = 0 \rightarrow (x-2)(x-9) = 0 \rightarrow \begin{cases} x-2=0 \rightarrow x=2 \\ x-9=0 \rightarrow x=9 \end{cases}$$

$$\text{ب)} \quad x^2 + 3x - 18 = 0 \rightarrow (x+6)(x-3) = 0 \rightarrow \begin{cases} x+6=0 \rightarrow x=-6 \\ x-3=0 \rightarrow x=3 \end{cases}$$

$$\text{الف)} \quad \omega x^2 - 11x + 18 = 0 \rightarrow x^2 - 11x + 18 = 0 \rightarrow (x-2)(x-9) = 0 \rightarrow \begin{cases} x=2 \\ x=9 \end{cases}$$

$$\text{ب)} \quad 3x^2 - 10x + 1 = 0 \rightarrow x^2 - 10x + 1 = 0 \rightarrow (x-1)(x-9) = 0 \rightarrow \begin{cases} x=1 \\ x=9 \end{cases}$$

$$\text{الف)} \quad 2x^2 - 5x + 3 = 0 \rightarrow x^2 - 5x + 3 = 0 \rightarrow (x-2)(x-3) = 0 \rightarrow \begin{cases} x=2 \\ x=3 \end{cases}$$

$$\text{ب)} \quad 2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 3 = 0 \rightarrow (x+2)(x+3) = 0 \rightarrow \begin{cases} x=-2 \\ x=-3 \end{cases}$$

$$\text{ج)} \quad 2x^2 - 5x + 12 = 0 \rightarrow \Delta = b^2 - 4ac = 25 - 96 = -71 < 0 \rightarrow \text{ریشه های حقیقی ندارد}$$

$$\text{د)} \quad 2x^2 + 5x + 9 = 0 \rightarrow \Delta = b^2 - 4ac = 25 - 72 = -47 < 0 \rightarrow \text{ریشه های حقیقی ندارد}$$

$$\text{الف)} \quad \begin{cases} s = \frac{-b}{a} = \frac{3}{1} = 3 \\ p = \frac{c}{a} = \frac{-1}{1} = -1 \end{cases} \rightarrow s^2 - 2p = 3^2 - (-2) = 9 + 2 = 11$$

$$\text{ب)} \quad \begin{cases} s = 3 \\ p = -1 \end{cases} \rightarrow s^2 - 3sp = 3^2 - (3 \times 3 \times -1) = 9 + 9 = 18$$

$$\text{الف)} \quad \frac{V \times V}{1! \times 1!} + \frac{9 \times 1}{1! \times 1!} = \frac{V \times V}{1 \times 1} + \frac{9 \times 1}{1 \times 1} = 1 + 9 = 10$$

$$\text{ب)} \quad \frac{9 \times 1 \times V}{3! \times 1!} - \frac{1 \times V}{1! \times 1!} = \frac{9 \times 1 \times V}{6 \times 1} - \frac{1 \times V}{1 \times 1} = 1.5 - 1 = 0.5$$