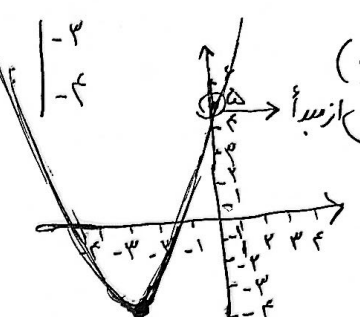
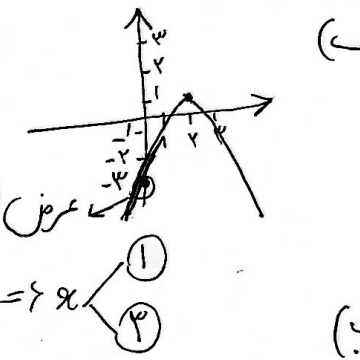


الف) $y = 0x^2 + 2x + 5 \Rightarrow \min$
 طول استریم: $\frac{-b}{2a} = \frac{-2}{2 \times 1} = -1$
 عرض استریم: $y = (-1)^2 + 2(-1) + 5 = 1 - 2 + 5 = 4$
 ب) $y = 0x^2 + 2x + 5 \Rightarrow \min$
 عرض از مبدأ: $y = 5$


الف) $y = 0x^2 + 2x + 5 \Rightarrow \min$
 $x = \frac{-b}{2a} = \frac{-2}{2 \times 1} = -1$
 $y = -(-1)^2 + 2(-1) + 5 = -1 - 2 + 5 = 2$
 ب) $y = -x^2 + 4x - 3 \Rightarrow \max$
 $x = \frac{-b}{2a} = \frac{-4}{2 \times (-1)} = 2$
 $y = -(2)^2 + 4(2) - 3 = -4 + 8 - 3 = 1$


$\Delta = b^2 - 4ac = (-2)^2 - 4(1)(5) = 4 - 20 = -16$
 الف) $\Delta > 0 \Rightarrow \frac{9}{\lambda} > \alpha \leq \frac{9}{\lambda}$
 ب) $\Delta = 0 \Rightarrow \alpha = \frac{9}{\lambda}$
 ج) $\Delta < 0 \Rightarrow \alpha > \frac{9}{\lambda}$
 د) $\Delta \geq 0 \Rightarrow \alpha \leq \frac{9}{\lambda}$
 دارای دو ریشه حقیقی
 دارای یک ریشه
 قاعد ریشه حقیقی
 معادله دارای ریشه است

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

الف) $x^2 - 2x - 1 = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-2) \pm \sqrt{4 - (-4)}}{2 \times 1} = \frac{2 \pm \sqrt{8}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2}$
 ب) $x^2 + x - 4 = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{1 - (-16)}}{2 \times 1} = \frac{-1 \pm \sqrt{17}}{2}$

$$\text{الف) } x^2 - 11x + 10 = 0 \Rightarrow (x-5)(x-2) = 0 \Rightarrow x \in \begin{matrix} 5 \\ 2 \end{matrix}$$

$$\text{ب) } x^2 + 3x - 10 = 0 \Rightarrow (x+5)(x-2) = 0 \Rightarrow x \in \begin{matrix} -5 \\ -2 \end{matrix}$$

$$\text{الف) } \omega x^2 - 12x + 7 = 0 \Rightarrow x^2 - 12x + \sqrt{12 \times \omega} = 0 \Rightarrow (x-3)(x-\omega) = 0 \Rightarrow x \in \begin{matrix} \frac{1}{\omega} \\ \omega = 1 \end{matrix}$$

$$\text{ب) } 3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + \sqrt{10 \times \frac{7}{3}} = 0 \Rightarrow (x-3)(x-7) = 0 \Rightarrow x \in \begin{matrix} \frac{7}{3} = 1 \\ \frac{3}{7} \end{matrix}$$

$$\text{الف) } 2x^2 - 5x + 3 = 0 \Rightarrow x^2 - 5x + \sqrt{3 \times 2} = 0 \Rightarrow (x-2)(x-3) = 0 \Rightarrow x \in \begin{matrix} \frac{3}{2} = 1 \\ \frac{2}{3} \end{matrix}$$

$$\text{ب) } 2x^2 + 5x + 3 = 0 \Rightarrow x^2 + 5x + \sqrt{3 \times 2} = 0 \Rightarrow (x+2)(x+3) = 0 \Rightarrow x \in \begin{matrix} \frac{3}{2} \\ -\frac{2}{3} = -1 \end{matrix}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-5) \pm \sqrt{25 - 4}}{2 \times 2} = \frac{5 \pm \sqrt{17}}{4}$$

$$\text{د) } 4x^2 + 7x + 9 = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-7 \pm \sqrt{49 - 144}}{2 \times 4} = \frac{-7 \pm \sqrt{-95}}{8} \Rightarrow \Delta = -95 = \text{فاقد ریشه حقیقی}$$

$$\beta = \frac{-b}{a}, \rho = \frac{c}{a}$$

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

$$\text{الف) } S_1 - 2P = \left(\frac{-(-3)}{1} \right) - 2 \left(\frac{-2}{1} \right) = 9 + 4 = 13$$

$$\text{ب) } S_1 - 3SP = 3 - 3(3)(-2) = 3 + 18 = 21$$

$$\text{الف) } \begin{pmatrix} 1 \\ \omega \end{pmatrix} + \begin{pmatrix} 9 \\ 2 \end{pmatrix} = \frac{1 \times \sqrt{18}}{1 \times 1} + \frac{9 \times \sqrt{18}}{1 \times 1} = 10\sqrt{2} = 14.14$$

$$\text{ب) } \begin{pmatrix} 9 \\ 3 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \frac{9 \times \sqrt{18}}{1 \times 1} - \frac{1 \times \sqrt{18}}{1 \times 1} = 8\sqrt{2} = 11.31$$