

$$\begin{aligned} \text{الف) } x^2 - 4x + 9 - 1 &= 0 \Rightarrow x^2 - 4x + 8 = 0 \Rightarrow (x-3)^2 - 1^2 = 0 \\ &\Rightarrow (x-3-1)(x-3+1) = 0 \Rightarrow (x-4)(x-2) = 0 \end{aligned} \quad \begin{cases} x=2 \\ x=4 \end{cases}$$

$$\begin{aligned} \text{ب) } x^2 + 8x + 17 - 9 &= 0 \Rightarrow x^2 + 8x + 8 = 0 \Rightarrow (x+4)^2 - 3^2 = 0 \\ &\Rightarrow (x+4-3)(x+4+3) = 0 \Rightarrow (x+1)(x+7) = 0 \end{aligned} \quad \begin{cases} x=-7 \\ x=-1 \end{cases}$$

$$\text{الف) } x^2 - 5x + 4 = 0 \Rightarrow (x-4)(x-1) = 0 \quad \begin{cases} x=4 \\ x=1 \end{cases}$$

$$\text{ب) } x^2 - 5x - 14 = 0 \Rightarrow (x-7)(x+2) = 0 \quad \begin{cases} x=7 \\ x=-2 \end{cases}$$

$$\begin{aligned} \text{الف) } x^2 - 3x - 5 &= 0 \quad \Delta = b^2 - 4ac = 9 - 4(-5) = 29 \\ \begin{cases} x = \frac{3 + \sqrt{29}}{2} \\ x = \frac{3 - \sqrt{29}}{2} \end{cases} \\ \text{ب) } 2x^2 - 8x + \frac{1}{2} &= 0 \quad \Delta = b^2 - 4ac = 16 - 4(2)(\frac{1}{2}) = 12 \\ \begin{cases} x = \frac{8 + \sqrt{12}}{4} \\ x = \frac{8 - \sqrt{12}}{4} \end{cases} \end{aligned}$$

$$\text{الف) } x^2 - 3x + 2 = 0 \Rightarrow (x-1)(x-2) = 0 \quad \begin{cases} x=1 \\ x=2 \end{cases} \quad \text{علم مستند}$$

$$\begin{aligned} \text{ب) } 5x^2 + x - 3 &= 0 \Rightarrow x^2 + x - 12 = 0 \Rightarrow (x+4)(x-3) = 0 \\ \begin{cases} x = -\frac{4}{5} \\ x = \frac{3}{5} \end{cases} \end{aligned} \quad \text{: } ac \text{ روش}$$

$$\begin{aligned} \text{الف) } 5x^2 - 12x + 7 &= 0 \Rightarrow x^2 - 12x + 35 = 0 \Rightarrow (x-5)(x-7) = 0 \\ \begin{cases} x = \frac{5}{5} = 1 \\ x = \frac{7}{5} \end{cases} \end{aligned}$$

$$\begin{aligned} \text{ب) } 4x^2 - 10x + 6 &= 0 \Rightarrow x^2 - 10x + 15 = 0 \Rightarrow (x-3)(x-7) = 0 \\ \begin{cases} x = \frac{3}{4} \\ x = \frac{7}{4} \end{cases} \end{aligned}$$

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

$$\text{الف) } -3x^2 + 5x - 1 = 0 \Rightarrow 25 - 4(-3)(-1) = 4 \Rightarrow \Delta = 4 \rightsquigarrow \text{دو ریشه حقیقی}$$

$$\text{ب) } 2x^2 - x + 2 = 0 \Rightarrow 1 - 4(2)(2) = -15 \Rightarrow \Delta = -15 \rightsquigarrow \text{فاصله حقیقی}$$

$$\text{ج) } 2x^2 - 4x + 2 = 0 \Rightarrow 16 - 4(2)(2) = 0 \Rightarrow \Delta = 0 \rightsquigarrow \text{دارای یک ریشه مضرب}$$

$$\text{د) } 2x^2 - x + 1 = 0 \Rightarrow 1 - 4(2)(1) = -7 \Rightarrow \Delta = -7 \rightsquigarrow \text{فاصله حقیقی}$$

$$2x^2 - 3x + a = 0 \Rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 9 - 4(2)a = 9 - 8a$$

$$\text{الف) } \Delta > 0 \rightsquigarrow 9 - 8a > 0 \Rightarrow 9 > 8a \Rightarrow \frac{9}{8} > a$$

$$\text{ب) } \Delta = 0 \rightsquigarrow 9 - 8a = 0 \Rightarrow 9 = 8a \Rightarrow a = \frac{9}{8}$$

$$\text{ج) } \Delta < 0 \rightsquigarrow 9 - 8a < 0 \Rightarrow 9 < 8a \Rightarrow \frac{9}{8} < a$$

$$\text{د) } \Delta = 0 \rightsquigarrow a \leq \frac{9}{8}$$

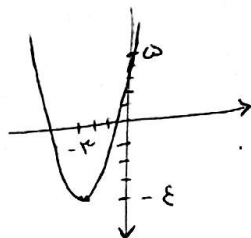
$$y = x^2 + 4x + 5$$

$$\text{نقطه اکتremum: } \min \left| \begin{matrix} -3 \\ -4 \end{matrix} \right|$$

$$\text{نقطه اکتremum: } -\frac{b}{2a} = -\frac{4}{2} = -2$$

$$\text{مقدار اکتremum: } 9 - 16 + 5 = -1$$

(با جایگذاری x)



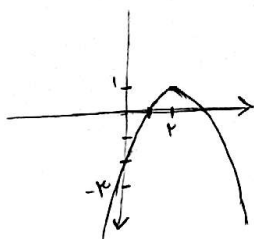
$$y = -x^2 + 4x - 3$$

$$\max \left| \begin{matrix} 2 \\ 1 \end{matrix} \right|$$

$$\text{نقطه اکتremum: } -\frac{b}{2a} = \frac{-4}{-2} = 2$$

$$\text{مقدار اکتremum: } -4 + 16 - 3 = 9$$

(با جایگذاری x)



نقطه اکتremum که محاسبه می شود:

$$\Delta = b^2 - 4ac = 16 - 4(-1)(-3) = 4$$

$$\sqrt{\Delta} = \sqrt{4} = 2$$

$$\left\{ \begin{matrix} \frac{-4+2}{-2} = \frac{-2}{-2} = 1 \Rightarrow 1 \\ \frac{-4-2}{-2} = \frac{-6}{-2} = 3 \Rightarrow 3 \end{matrix} \right.$$

$$\left\{ \begin{matrix} \frac{-4+2}{-2} = \frac{-2}{-2} = 1 \Rightarrow 1 \\ \frac{-4-2}{-2} = \frac{-6}{-2} = 3 \Rightarrow 3 \end{matrix} \right.$$

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

$$\text{الف) } S^2 - 2P = 9 + 4 = 13$$

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

$$\text{ب) } S^2 - 4SP = 9 + 16 = 25$$

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