

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

ب) $x^2 + 8x + 17 - 9 = 0 \Rightarrow x^2 + 8x + 8 = 0 \Rightarrow (x+4)^2 - 4^2 = 0$
 $\Rightarrow (x+4-4)(x+4+4) = 0 \Rightarrow (x)(x+8) = 0 \Rightarrow \begin{cases} x=-8 \\ x=0 \end{cases}$

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

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

الف) $x^2 - 3x - 5 = 0$

$\Delta = b^2 - 4ac = 9 - 4(-5) = 29$

$\begin{cases} x = \frac{3 + \sqrt{29}}{2} \\ x = \frac{3 - \sqrt{29}}{2} \end{cases}$

ب) $2x^2 - 8x + \frac{1}{2} = 0$

$\Delta = b^2 - 4ac = 64 - 4(2)(\frac{1}{2}) = 60$

$\begin{cases} x = \frac{4 + \sqrt{15}}{2} \\ x = \frac{4 - \sqrt{15}}{2} \end{cases}$

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

ب) $5x^2 + x - 12 = 0 \Rightarrow x^2 + \frac{1}{5}x - \frac{12}{5} = 0 \Rightarrow (x+4)(x-3) = 0$

$\begin{cases} x = -\frac{4}{5} \\ x = \frac{3}{5} \end{cases}$

: ac

الف) $5x^2 - 12x + 7 = 0 \Rightarrow x^2 - \frac{12}{5}x + \frac{7}{5} = 0 \Rightarrow (x-5)(x-7) = 0$

$\begin{cases} x = \frac{5}{5} = 1 \\ x = \frac{7}{5} \end{cases}$

ب) $4x^2 - 10x + 6 = 0 \Rightarrow x^2 - \frac{5}{2}x + \frac{3}{2} = 0 \Rightarrow (x-3)(x-1) = 0$

$\begin{cases} x = \frac{3}{2} \\ x = \frac{1}{2} \end{cases}$

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

5

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

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

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

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

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

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

5

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

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

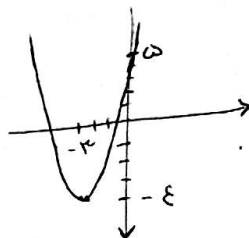
د) $\Delta = 0 \Rightarrow a \leq \frac{9}{8}$

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

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

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

مقدار اکتremum: $9 - 16 + 5 = -1$
(با جایگذاری)



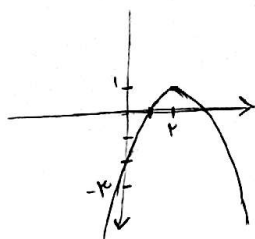
5

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

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

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

مقدار اکتremum: $-4 + 16 - 3 = 9$
(با جایگذاری)



5

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

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

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

$$\begin{cases} \frac{-4+2}{-2} = \frac{-2}{-2} = 1 \Rightarrow 1 \\ \frac{-4-2}{-2} = \frac{-6}{-2} = 3 \Rightarrow 3 \end{cases}$$

$$\begin{cases} \frac{-4+2}{-2} = \frac{-2}{-2} = 1 \Rightarrow 1 \\ \frac{-4-2}{-2} = \frac{-6}{-2} = 3 \Rightarrow 3 \end{cases}$$

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

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

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

الف) $S^2 - 2P = 9 + 4 = 13$

ب) $S^2 - 4SP = 9 - 4(-6) = 33$

5