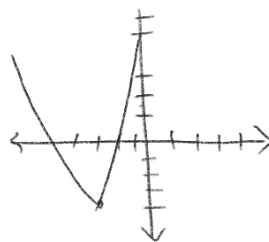


$$\text{ext} \begin{vmatrix} -\frac{b}{2a} \\ -\frac{\Delta}{4a} \end{vmatrix} \quad \Delta = 36 - 20 = 14$$

$$\Rightarrow \begin{vmatrix} -3 \\ -4 \end{vmatrix}$$

الف) نوع نقطه Min دار است

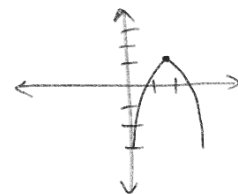


ب)

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$$\text{ext} \begin{vmatrix} 2 \\ 1 \end{vmatrix}$$

$$\Delta = 14 - 12 = 2$$



الف)

۲

$$a = 3 \quad \uparrow \quad -x^2 + 4x - 3 = 0$$

$$-(x-3)(x-1) \quad \downarrow \quad x=1$$

ب) در نقاط ا و ۳ قطع می‌کند

$$\{a \mid a \in \mathbb{R}, a < \frac{10}{11}\}$$

$$\Delta > 0 \rightarrow \text{دو جواب (ا و ب)} \quad 1 = 9 - 11a$$

$$\Delta = 0 \rightarrow \text{اجواب}$$

$$a - 11a = 0 \quad a = 11a \quad \boxed{a = \frac{9}{11}}$$

$$\Delta < 0 \rightarrow \text{جواب ندارد}$$

$$-1 = 9 - 11a \quad -10 = -11a \rightarrow a = \frac{10}{11}$$

۳

الف) $x^2 - 2x - 1 = 0 \xrightarrow{+2} (x-2x+1) = 2 \rightarrow (x-1)^2 = 2 \rightarrow \begin{cases} x-1 = +\sqrt{2} \\ x-1 = -\sqrt{2} \end{cases}$

$$\begin{cases} x = \sqrt{2} + 1 \\ x = -\sqrt{2} + 1 \end{cases}$$

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

$$\begin{cases} x = \frac{\sqrt{5}}{2} + \frac{1}{2} \\ x = -\frac{\sqrt{5}}{2} + \frac{1}{2} \end{cases}$$

۴

الف) $x^2 - 2x - 1 = 0 \rightarrow \Delta = 4 + 4 = 8 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \begin{cases} x = \frac{2 + \sqrt{8}}{2} = \sqrt{2} + 1 \\ x = \frac{2 - \sqrt{8}}{2} = 1 - \sqrt{2} \end{cases}$

۵

ب) $x^2 + x - 2 = 0 \rightarrow \Delta = 1 + 4 = 5 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \begin{cases} x = \frac{-1 + \sqrt{5}}{2} \\ x = \frac{-1 - \sqrt{5}}{2} \end{cases}$

الف) $x^2 - 11x + 18 = 0 \rightarrow (x-2)(x-9) = 0 \quad \begin{cases} x-2=0 \rightarrow x=2 \\ x-9=0 \rightarrow x=9 \end{cases}$ ب) $x^2 + 13x - 24 = 0 \rightarrow (x+12)(x-2) = 0 \quad \begin{cases} x+12=0 \rightarrow x=-12 \\ x-2=0 \rightarrow x=2 \end{cases}$	6
الف) $5x^2 - 14x + 8 = 0 \rightarrow x^2 - 14x + 32 = 0 \quad (x-2)(x-16) = 0 \quad \begin{cases} x=2 \\ x=16 \end{cases}$ ب) $3x^2 - 10x + 11 = 0 \rightarrow x^2 - 10x + 11 = 0 \quad (x-1)(x-11) = 0 \quad \begin{cases} x=1 \\ x=11 \end{cases}$	7
الف) $2x^2 - 5x + 3 = 0 \rightarrow x^2 - 5x + 3 = 0 \quad (x-2)(x-3) = 0 \quad \begin{cases} x=2 \\ x=3 \end{cases}$ ب) $2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 3 = 0 \quad (x+2)(x+3) = 0 \quad \begin{cases} x=-2 \\ x=-3 \end{cases}$ ج) $2x^2 - 5x + 1 = 0 \rightarrow \Delta = 25 - 8 = 17 \quad \begin{cases} x = \frac{5 + \sqrt{17}}{4} \\ x = \frac{5 - \sqrt{17}}{4} \end{cases}$ د) $3x^2 + 7x + 4 = 0 \rightarrow \Delta = 49 - 48 = 1 \rightarrow \begin{cases} x = -1 \\ x = -4/3 \end{cases}$	8
$S = \frac{-b}{a} = 3 \quad P = \frac{c}{a} = -2$ الف) $9 + x = 13$ ب) $2V - 3 \times 3 \times 2 = 2V + 11 = 25$	9
الف) $\binom{V}{5} + \binom{9}{r} = \frac{V!}{5!(V-5)!} + \frac{9!}{r!(9-r)!} = 5V$ ب) $\binom{9}{r} - \binom{1}{r} = \frac{9!}{r!(9-r)!} - \frac{1!}{r!(1-r)!} = 112$	10