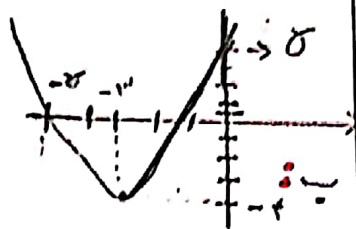


$$\text{ext} \left| \begin{array}{l} -\frac{b}{2a} \\ \sqrt{b^2 - 4ac} \end{array} \right| \Rightarrow \text{ext} \left| \begin{array}{l} -\frac{6}{2} = -3 \\ -4 \end{array} \right| \Rightarrow \text{نوع نقطه} = \min$$

چون a مثبت است.

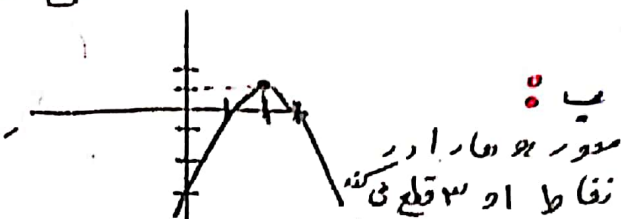
$$y = x^2 + 6x + 8 \rightarrow \text{سیمی داره شده}$$



$$\text{ext} \left| \begin{array}{l} -\frac{b}{2a} \\ \sqrt{b^2 - 4ac} \end{array} \right| \Rightarrow \text{ext} \left| \begin{array}{l} -\frac{4}{-2} = 2 \\ -5 \end{array} \right| \Rightarrow \text{نوع نقطه} = \max$$

چون a منفی است.

$$y = -x^2 + 4x - 3 \rightarrow \text{سیمی داره شده}$$



$$2x^2 - 3x + a = 0 \quad \Delta > 0 \Rightarrow 9 - 12a > 0 \Rightarrow 9 > 12a \Rightarrow \frac{3}{4} > a \rightarrow \text{الف}$$

$$\Delta = 0 \Rightarrow 9 - 12a = 0 \Rightarrow 9 = 12a \Rightarrow \frac{3}{4} = a \rightarrow \text{ب}$$

$$\Delta < 0 \Rightarrow 9 - 12a < 0 \Rightarrow 9 < 12a \Rightarrow a > \frac{3}{4} \rightarrow \text{ج}$$

$$\Delta \geq 0 \Rightarrow 9 - 12a \geq 0 \Rightarrow 9 \geq 12a \Rightarrow \frac{3}{4} \geq a \rightarrow \text{د}$$

$$\text{الف: } x^2 - 2x - 1 = 0 \rightarrow x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2$$

$$\rightarrow x-1 = \pm \sqrt{2} \rightarrow x \rightarrow 1 \pm \sqrt{2}$$

$$\text{ب: } x^2 - 12x - 1 = 0 \quad \Delta = 144 + 4 = 148$$

$$x = \frac{12 \pm \sqrt{148}}{2} = 6 \pm \sqrt{37}$$

$$x \rightarrow \frac{1}{4} \pm \sqrt{\frac{5}{4}}$$

$$\text{الف: } x^2 - 2x - 1 = 0 \quad \Delta = b^2 - 4ac \Rightarrow \Delta = 4 + 4 = 8 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$\rightarrow x = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2}$$

$$\text{ب: } x^2 + x - 2 = 0 \quad \Delta = b^2 - 4ac \Rightarrow \Delta = 1 + 8 = 9 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$\rightarrow x = \frac{-1 \pm 3}{2} \rightarrow x \rightarrow \frac{-1 + 3}{2} = 1, \quad x \rightarrow \frac{-1 - 3}{2} = -2$$

$$\text{الف} : x^2 - 11x + 21 = 0 \rightarrow (x - 5)(x - 7) = 0$$

$$\Rightarrow x \rightarrow \begin{matrix} \textcircled{5} \\ \textcircled{7} \end{matrix}$$

$$\text{ب} : x^2 + 3x - 21 = 0 \rightarrow (x + 7)(x - 5) = 0 \Rightarrow x \rightarrow \begin{matrix} \textcircled{-7} \\ \textcircled{5} \end{matrix}$$

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$$\text{الف} : x^2 - 12x + 35 = 0 \rightarrow x^2 - 12x + 35 = 0 \rightarrow (x - 5)(x - 7) = 0$$

$$\Rightarrow x \rightarrow \begin{matrix} \frac{5}{7} \\ \frac{7}{5} \end{matrix}$$

7

$$\text{ب} : 3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 = 0 \rightarrow (x - 7)(x - 3) = 0$$

$$\Rightarrow x \rightarrow \begin{matrix} \frac{7}{3} \\ \frac{3}{7} \end{matrix}$$

$$\text{الف} : 2x^2 - 8x + 6 = 0 \rightarrow x^2 - 4x + 3 = 0 \rightarrow (x - 1)(x - 3) = 0 \Rightarrow x \rightarrow \begin{matrix} \frac{1}{3} \\ \frac{3}{1} \end{matrix}$$

$$\text{ب} : 4x^2 + 8x + 3 = 0 \rightarrow x^2 + 2x + \frac{3}{4} = 0 \rightarrow (x + \frac{1}{2})(x + \frac{3}{2}) = 0 \Rightarrow x \rightarrow \begin{matrix} -\frac{1}{2} \\ -\frac{3}{2} \end{matrix}$$

$$\text{ج} : 2x^2 - 8x + 1 = 0 \rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 16 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow x = \frac{8 \pm 4}{4} \Rightarrow x = \frac{8+4}{4} = 3, \frac{8-4}{4} = 1$$

$$\text{د} : 5x^2 + 7x + 9 = 0 \quad \Delta = 49 - 180 = -131$$

8

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

$$S = -\frac{b}{a} = 3, P = \frac{c}{a} = -2$$

$$\text{الف} : S^2 - 3P = 13$$

9

$$\text{ب} : S^3 - 3SP = 58$$

$$-3 \times 3 \times -2 = +18$$

$$\text{الف} : \binom{9}{5} + \binom{9}{4} = \frac{9!}{5!4!} + \frac{9!}{4!5!}$$

$$\therefore \binom{9}{5} - \binom{9}{4} = \frac{9!}{(9-5)!5!} - \frac{9!}{(9-4)!4!} = \frac{9 \times 8 \times 7 \times 6 \times 5!}{4! \times 5!} - \frac{9 \times 8 \times 7 \times 6 \times 4!}{3! \times 4!} = 144 - 126 = 18$$