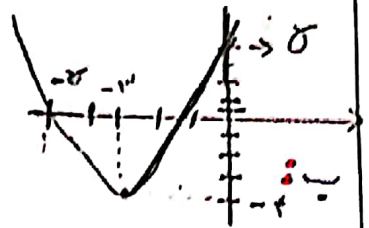


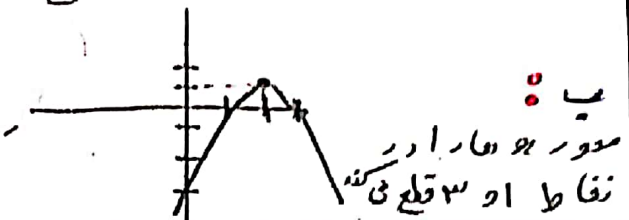
الف: $\text{ext} \left| \begin{array}{l} -\frac{b}{2a} \\ \sqrt{b^2 - 4ac} \end{array} \right| \Rightarrow \text{ext} \left| \begin{array}{l} -\frac{6}{2} = -3 \\ -4 \end{array} \right|$
 نوع نقطه = min زیرا a مثبت است.

سیمی داده شده $y = x^2 + 6x + 5$



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

سیمی داده شده $y = -x^2 + 4x - 3$



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

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

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

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

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

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

ب: $x^2 - 12x - 1 = 0 + \frac{5}{2} + \frac{5}{2}$
 $x_1 - x_2 + \frac{1}{2} = \frac{5}{2}$
 $-\frac{1}{2} - \frac{1}{2}$
 $(x - \frac{1}{2})^2 = \frac{5}{2}$
 $x - \frac{1}{2} = \pm \sqrt{\frac{5}{2}}$

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

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

ب: $x^2 + x - 2 = 0 \Rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 1 + 8 = 9 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow x = \frac{-1 \pm \sqrt{9}}{2}$
 $\rightarrow x = \frac{-1 \pm 3}{2} \rightarrow x \rightarrow \frac{-1 + 3}{2} = 1$
 $\rightarrow x \rightarrow \frac{-1 - 3}{2} = -2$

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

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

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

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$$\text{الف} : 2x^2 - 12x + 17 = 0 \rightarrow x^2 - 6x + 8.5 = 0 \rightarrow (x - 2)(x - 4) = 0$$

$$\Rightarrow x \rightarrow \begin{matrix} \frac{2}{0} \\ \frac{4}{0} \end{matrix} \textcircled{1}$$

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

$$\Rightarrow x \rightarrow \begin{matrix} \frac{7}{3} \\ \frac{3}{7} \end{matrix} \textcircled{1}$$

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

$$\text{ب} : 4x^2 + 8x + 3 = 0 \rightarrow x^2 + 2x + 0.75 = 0 \rightarrow (x + 1)(x + 0.75) = 0 \Rightarrow x \rightarrow \begin{matrix} -1 \\ -0.75 \end{matrix} \textcircled{1}$$

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$$\text{ج} : 2x^2 - 8x + 1 = 0 \rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 16 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow x = \frac{8 \pm 4}{2} \Rightarrow x = \frac{8+4}{2} = 6, \frac{8-4}{2} = 2$$

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

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

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

$$\text{الف} : S^2 - 3P = 13$$

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$$\text{ب} : S^3 - 3SP = 58$$

$$-3 \times 3 \times -2 = +12$$

$$\text{الف} : \binom{9}{8} + \binom{9}{7} = \frac{9!}{1!8!} + \frac{9!}{2!7!}$$

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$$\therefore \binom{9}{3} - \binom{7}{4} = \frac{9!}{6!3!} - \frac{7!}{3!4!} = \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{6 \times 5 \times 4 \times 3 \times 2 \times 1} - \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1 \times 4 \times 3 \times 2 \times 1} = 84 - 35 = 49$$