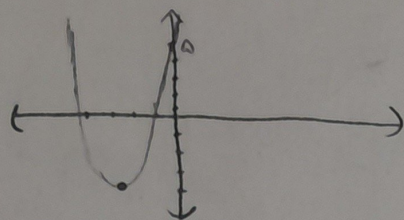


نام و نام خانوادگی: رتبه: شماره: کلاس: A

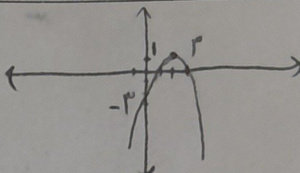
$$x_{ext} = \frac{-b}{2a} = \frac{-4}{2} = -2 \rightarrow \begin{bmatrix} -2 \\ 2 \end{bmatrix} \rightarrow y = 9 + (-18) + 5 = -4 \rightarrow ext \begin{bmatrix} -2 \\ -4 \end{bmatrix} \quad (الف)$$



نوع اکسترمم = Min

(ب)

$$x_{ext} = \frac{-b}{2a} = \frac{-4}{-2} = 2 \rightarrow \begin{bmatrix} 2 \\ 1 \end{bmatrix} \rightarrow y = -4 + 1 - 3 = -6 \rightarrow ext = \begin{bmatrix} 2 \\ 1 \end{bmatrix} \quad (الف)$$



$$\Delta = b^2 - 4ac = 16 - (4x - 1x - 3) = 4 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-4 \pm 2}{-2} = \begin{cases} x = 3 \\ x = 1 \end{cases} \quad (ب)$$

$$2x^2 - 3x + a = 0 \quad \Delta = b^2 - 4ac > 0 \rightarrow 9 - 12a > 0 \rightarrow \boxed{a < \frac{3}{4}} \quad (الف) \quad \text{دو ریشه متمایز} \leftarrow \Delta = مثبت$$

$$9 - 12a = 0 \rightarrow \boxed{a = \frac{3}{4}} \quad (ب) \quad \text{یک ریشه مضاعف} \leftarrow \Delta = صفر$$

$$9 - 12a < 0 \rightarrow \boxed{a > \frac{3}{4}} \quad (ج) \quad \text{فاقد ریشه حقیقی} \leftarrow \Delta = منفی$$

$$\Delta = 0 \cup \Delta > 0 \rightarrow a = \frac{3}{4} \cup a < \frac{3}{4} \rightarrow \boxed{a \leq \frac{3}{4}} \quad (د) \quad \text{ریشه‌ها متمایز یا مضاعف} \leftarrow \Delta \geq 0$$

$$(x^2 - 2x - 1 = 0) + 2 \rightarrow x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2 \rightarrow x-1 = \sqrt{2} \rightarrow \boxed{x = \sqrt{2} + 1} \quad (الف)$$

$$(x^2 - x - 1 = 0) + \frac{5}{4} \rightarrow x^2 - x + \frac{1}{4} = \frac{5}{4} \rightarrow (x + \frac{1}{2})^2 = \frac{5}{4} \rightarrow x + \frac{1}{2} = \sqrt{\frac{5}{4}} \rightarrow \boxed{x = \frac{\sqrt{5}}{2} + \frac{1}{2}} \quad (ب)$$

$$\Delta = b^2 - 4ac = 4 - (4x | x - 1) = 1 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{1}}{2} = \frac{2 \pm 1}{2} = \begin{cases} x = 1 + \sqrt{2} \\ x = 1 - \sqrt{2} \end{cases} \quad (الف)$$

$$\Delta = b^2 - 4ac = 1 - (4x | x - 4) = 17 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{17}}{2} = \begin{cases} x = \frac{-1 - \sqrt{17}}{2} \\ x = \frac{-1 + \sqrt{17}}{2} \end{cases} \quad (ب)$$

$$x^2 - 11x + 11 = 0 \rightarrow (\overset{\circ}{x-5})(\overset{\circ}{x-6}) = 0 \rightarrow \begin{cases} x=5 \\ x=6 \end{cases} \quad (\text{الف})$$

$$x^2 + 3x - 18 = 0 \rightarrow (x-3)(x+6) = 0 \rightarrow \begin{cases} x=3 \\ x=-6 \end{cases} \quad (-)$$

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

$$3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 = 0 \rightarrow (x-3)(x-7) = 0 \rightarrow \begin{cases} x = \frac{3}{3} = 1 \\ x = \frac{7}{3} \end{cases} \quad (-)$$

$$a+b+c=0 \rightarrow x=1, \frac{c}{a} \rightarrow \boxed{x=1, x=\frac{c}{a}}$$

$$a+c=b \rightarrow x=-1, -\frac{c}{a} \rightarrow \boxed{x=-1, x=-\frac{c}{a}}$$

$$\Delta = b^2 - 4ac \rightarrow 16 - (4 \times 1 \times 1) = 12 \cdot x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{12}}{4} \rightarrow \boxed{x = \frac{5 + \sqrt{12}}{4}, x = \frac{5 - \sqrt{12}}{4}} \quad (ج)$$

$$\Delta = b^2 - 4ac \rightarrow 49 - (4 \times 9) = -9 \rightarrow \text{چون دالة منفی است پس معادله جواب ندارد} \quad (د)$$

$$x^2 - 3x - 2 = 0 \quad S = -\frac{b}{a} \quad P = \frac{c}{a} \rightarrow S = 3, P = -2 \quad (\text{الف})$$

$$S^2 - 2P = 3^2 - 2 \times (-2) = 9 + 4 = \boxed{13}$$

$$S^3 - 3SP = 3^3 - 3 \times 3 \times (-2) = 27 + 18 = \boxed{45} \quad (-)$$

$$\begin{pmatrix} 7 \\ 5 \end{pmatrix} + \begin{pmatrix} 9 \\ 2 \end{pmatrix} = \frac{7 \times 9 \times 5 \times 2 \times 1}{5 \times 2 \times 1 \times 1} + \frac{9 \times 1}{2} = 21 + 4.5 = \boxed{25.5} \quad (\text{الف})$$

$$\begin{pmatrix} 9 \\ 3 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \frac{9 \times 1 \times 3 \times 2 \times 1}{3 \times 2 \times 1} - \frac{1 \times 2}{2 \times 1} = 18 - 1 = \boxed{17} \quad (-)$$