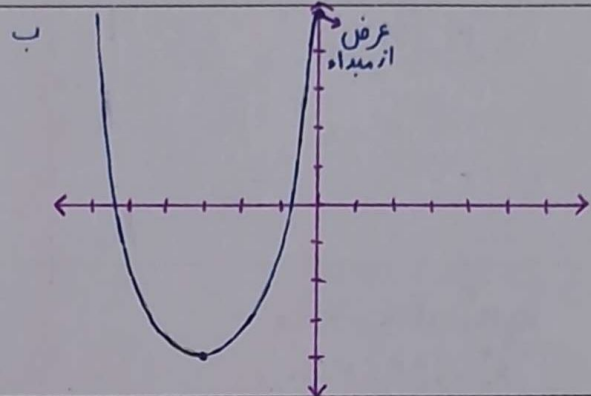


الف

$$\text{ent} = \begin{cases} \frac{-b}{2a} = \frac{-6}{2} = -3 & \text{Min دار است} \\ \frac{-\Delta}{4a} = \frac{-(b^2 - 4ac)}{4a} = \frac{-(36 - 12)}{4} = \frac{-24}{4} = -6 \end{cases}$$



الف

$$\text{ent} = \begin{cases} \frac{-b}{2a} = \frac{-4}{2} = -2 \\ \frac{-\Delta}{4a} = \frac{-(b^2 - 4ac)}{4a} = \frac{-(16 - 12)}{-4} = \frac{-4}{-4} = 1 \end{cases}$$

ب

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

$$\Delta = b^2 - 4ac \quad x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$\Delta = 16 - 12 = 4 \quad x = \frac{-4 \pm \sqrt{4}}{-2}$$

$$\begin{cases} x = \frac{-b + \sqrt{\Delta}}{2a} \\ x = \frac{-b - \sqrt{\Delta}}{2a} \end{cases} \quad \boxed{x = 3} \quad \boxed{x = 1}$$

$\Delta = b^2 - 4ac$ ، $\Delta > 0$: 2 ریشه حقیقی ، $\Delta = 0$: 1 ریشه مضاعف ، $\Delta < 0$: 0 ریشه حقیقی ، $\Delta \geq 0$: 1 ریشه حقیقی

الف $\Delta > 0$

$$\Delta = 9 - 1a$$

$$9 - 1a > 0$$

$$9 > 1a$$

$$\boxed{\frac{9}{1} > a}$$

ب $\Delta = 0$

$$\Delta = 9 - 1a$$

$$9 - 1a = 0$$

$$9 = 1a$$

$$\boxed{\frac{9}{1} = a}$$

ج $\Delta < 0$

$$\Delta = 9 - 1a$$

$$9 - 1a < 0$$

$$9 < 1a$$

$$\boxed{\frac{9}{1} < a}$$

د $\Delta \geq 0$

$$\Delta = 9 - 1a$$

$$9 - 1a \geq 0$$

$$9 \geq 1a$$

$$\boxed{\frac{9}{1} \geq a}$$

الف

$$x^2 - 2x - 1 + \sqrt{2} - \sqrt{2} = 0$$

$$(x-1)^2 - 2 = 0$$

$$(x-1+\sqrt{2})(x-1-\sqrt{2}) = 0$$

$$\boxed{x = 1-\sqrt{2}} \quad \boxed{x = 1+\sqrt{2}}$$

ب

$$x^2 - x - 1 + \frac{\sqrt{5}}{4} - \frac{\sqrt{5}}{4} = 0$$

$$(x - \frac{1}{2})^2 - \frac{5}{4} = 0$$

$$(x - \frac{1}{2} + \frac{\sqrt{5}}{2})(x - \frac{1}{2} - \frac{\sqrt{5}}{2}) = 0$$

$$\boxed{x = \frac{1-\sqrt{5}}{2}} \quad \boxed{x = \frac{1+\sqrt{5}}{2}}$$

الف

$$x^2 - 2x - 1 = 0$$

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

$$\Delta = 4 + 4 = 8$$

$$\begin{cases} x = \frac{-b + \sqrt{\Delta}}{2a} \\ x = \frac{-b - \sqrt{\Delta}}{2a} \end{cases} \quad \begin{cases} x = \frac{2 - \sqrt{8}}{2} \\ x = \frac{2 + \sqrt{8}}{2} \end{cases}$$

$$\boxed{x = 1 - \sqrt{2}} \quad \boxed{x = 1 + \sqrt{2}}$$

ب

$$x^2 + x - 4 = 0$$

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

$$\Delta = 1 + 16 = 17$$

$$\begin{cases} x = \frac{-b + \sqrt{\Delta}}{2a} \\ x = \frac{-b - \sqrt{\Delta}}{2a} \end{cases} \quad \begin{cases} x = \frac{-1 + \sqrt{17}}{2} \\ x = \frac{-1 - \sqrt{17}}{2} \end{cases}$$

الف	$x^2 - 11x + 11 = 0$ $(x-4)(x-7) = 0$ $x=4$ $x=7$	ب	$x^2 + 13x - 11 = 0$ $(x-4)(x+7) = 0$ $x=4$ $x=-7$	6				
الف	$\Delta x^2 - 12x + 7 = 0$ $x^2 - 12x + 3\Delta = 0$ $(x-5)(x-7) = 0$ $x = \frac{\Delta-1}{\Delta}$ $x = \frac{7}{\Delta}$	ب	$13x^2 - 10x + 7 = 0$ $x^2 - 10x + 21 = 0$ $(x-3)(x-7) = 0$ $x = \frac{10}{13} = 1$ $x = \frac{7}{13}$	7				
الف رسی	$2x^2 - 5x + 3 = 0$ $x^2 - 5x + 6 = 0$ $(x-2)(x-3) = 0$ $x = \frac{5}{2} = 1$ $x = \frac{3}{2}$	ب رسی	$2x^2 + 5x + 3 = 0$ $x^2 + 5x + 6 = 0$ $(x+2)(x+3) = 0$ $x = -\frac{5}{2} = -1$ $x = -\frac{3}{2}$	ج دلتا	$2x^2 - 5x + 1 = 0$ $\Delta = b^2 - 4ac$ $\Delta = 25 - 4 = 17$ $x = \frac{-b + \sqrt{\Delta}}{2a}$$x = \frac{-b - \sqrt{\Delta}}{2a}$ $x = \frac{\Delta - \sqrt{17}}{2}$$x = \frac{\Delta + \sqrt{17}}{2}$	د دلتا	$4x^2 + 7x + 9 = 0$ $\Delta = b^2 - 4ac$ $\Delta = 49 - 144 = -95$ $\Delta < 0$ معادله جواب ندارد.	9
$S = \frac{-b}{a} \quad P = \frac{c}{a} \quad S = \frac{-(-13)}{1} = 13 \quad P = \frac{-7}{1} = -7$ 3) $S^2 - PP = 13^2 - (13 \times (-7)) = 169 - (-91) = 169 + 91 = 260$ 4) $S^3 - P^3SP = 13^3 - (13 \times 13 \times (-7)) = 2197 - (-1183) = 2197 + 1183 = 3380$						9		
$\binom{n}{k} = \frac{n!}{k!(n-k)!}$ 3) $\binom{7}{5} + \binom{9}{4} = \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(5 \times 4 \times 3 \times 2 \times 1)(2 \times 1)} + \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(4 \times 3 \times 2 \times 1)(5 \times 4 \times 3 \times 2 \times 1)} = \frac{7 \times 6}{2} + \frac{9 \times 8 \times 7}{6} = \frac{42}{2} + \frac{84}{1} = 21 + 84 = 105$ 4) $\binom{9}{3} - \binom{11}{4} = \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(3 \times 2 \times 1)(6 \times 5 \times 4 \times 3 \times 2 \times 1)} - \frac{11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(4 \times 3 \times 2 \times 1)(7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)} = \frac{84}{6} - \frac{165}{6} = 14 - 27.5 = -13.5$						10		