

$$x^2 - 4x = -1$$

$$x^2 - 4x + 4 = -1 + 4$$

$$(x-2)^2 = 1 \quad x-2 = \pm 1 \quad \begin{cases} x=2 \\ x=4 \end{cases}$$

$$x^2 + 11x = -1$$

$$x^2 + 11x + 12 = -1 + 12$$

$$(x+3)^2 = 9 \quad x+3 = \pm 3 \quad \begin{cases} x=-1 \\ x=-6 \end{cases}$$

$$x^2 - 5x + 4 = (x-1)(x-4) = 0 \quad \begin{cases} x=1 \\ x=4 \end{cases}$$

$$x^2 - 5x - 14 = (x-7)(x+2) = 0 \quad \begin{cases} x=7 \\ x=-2 \end{cases}$$

$$x^2 - 3x - 4 = 0 \quad a=1 \quad b=-3 \quad c=-4$$

$$\Delta = b^2 - 4ac = (-3)^2 - 4(1)(-4) = 9 + 16 = 25$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{3 \pm \sqrt{25}}{2} \quad x = \frac{3+5}{2} \quad x = \frac{3-5}{2}$$

$$12x^2 - 13x + \frac{1}{12} = 0 \quad a=12 \quad b=-13 \quad c=\frac{1}{12}$$

$$\Delta = b^2 - 4ac = (-13)^2 - 4(12)(\frac{1}{12}) = 169 - 4 = 165$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{13 \pm \sqrt{165}}{24} \quad x = 1 + \frac{\sqrt{165}}{24} \quad x = 1 - \frac{\sqrt{165}}{24}$$

$$x^2 - 13x + 12 = 0 \quad (x-1)(x-12) = 0 \quad \begin{cases} x=1 \\ x=12 \end{cases}$$

$$12x^2 + x - 12 = 0 \quad a=12 \quad b=1 \quad c=-12$$

$$\Delta = b^2 - 4ac = (1)^2 - 4(12)(-12) = 1 + 576 = 577$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{577}}{24} \quad x = \frac{1}{12} \quad x = -1$$

$$5x^2 - 11x + 4 = 0 \quad x^2 - 11x + 40 = 0$$

$$(x-5)(x-8) = 0 \quad \begin{cases} x=5 \\ x=8 \end{cases}$$

$$\begin{cases} x_1 = 1 \\ x_2 = \frac{4}{5} \end{cases}$$

$$12x^2 - 10x + 1 = 0 \quad x^2 - 10x + 12 = 0$$

$$(x-12)(x-1) = 0 \quad \begin{cases} x=12 \\ x=1 \end{cases}$$

$$\begin{cases} x_1 = 1 \\ x_2 = \frac{1}{12} \end{cases}$$

در ادامه به جواب های معادله را قسمت به قسمت

سوال مقدار ریشه
خواسته!

$$x^2 - 2x - 1 = 0 \quad a = -2 \quad b = -1 \quad c = -1$$

$$\Delta = (2)^2 - 4(-1)(-1) = 12$$

$$x = \frac{-2 \pm \sqrt{12}}{2 \times -1}$$

$$x = \frac{2 \pm \sqrt{12}}{2}$$

$$x = \frac{2 \pm \sqrt{12}}{2}$$

دو ریشه دارد

$$x^2 - x + 2 = 0 \quad a = 2 \quad b = -1 \quad c = 2$$

$$\Delta = (-1)^2 - 4(2)(2) = 1 - 16 = -15$$

ریشه ندارد

سوال (4)

$$x^2 - kx + 2 = 0 \quad a = 2 \quad b = -k \quad c = 2$$

$$\Delta = (-k)^2 - 4(2)(2) = 0$$

یک ریشه دارد.

$$x = \frac{-(-k) \pm \sqrt{0}}{2(2)} = 1 \quad x = 1$$

(15)

$$x^2 - x + 1 = 0 \quad a = 1 \quad b = -1 \quad c = 1$$

$$\Delta = (-1)^2 - 4(1)(1) = -3$$

ریشه ندارد

$$x^2 - 3x + a = 0 \quad a = 2 \quad b = -3 \quad c = a$$

$$\Delta = b^2 - 4ac = (-3)^2 - 4(2)(a) = 9 - 12a$$

$$9 - 12a > 0 \rightarrow 9 > 12a \rightarrow a < \frac{3}{4}$$

$$9 - 12a = 0 \rightarrow 12a = 9 \rightarrow a = \frac{3}{4}$$

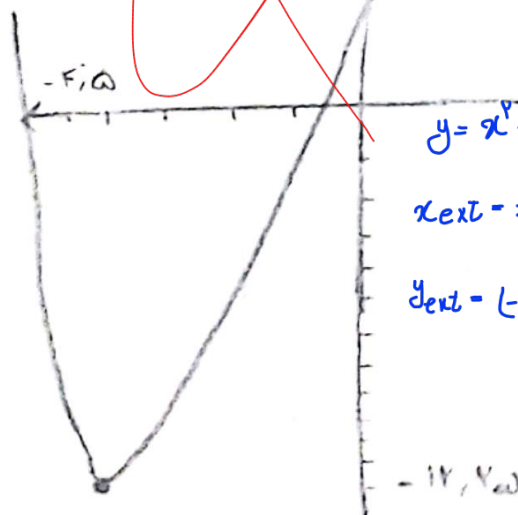
$$9 - 12a < 0 \rightarrow 9 < 12a \rightarrow a > \frac{3}{4}$$

$$9 - 12a \geq 0 \rightarrow a \leq \frac{3}{4}$$

$$y = x^2 + 9x + 1 \quad a = 1 \quad b = 9 \quad c = 1$$

$$\min \left\{ x = -\frac{b}{2a} = \frac{-9}{2} = -4.5 \right.$$

$$y = \left(-\frac{9}{2}\right)^2 + 9\left(-\frac{9}{2}\right) + 1 = \frac{81}{4} - \frac{81}{2} + 1 = \frac{81 - 162 + 4}{4} = \frac{-77}{4}$$



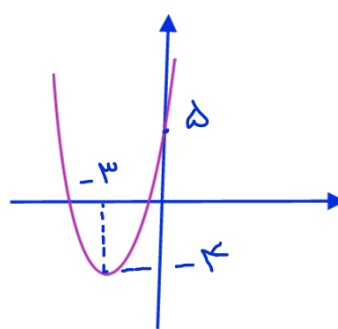
$$y = x^2 + 9x + 1$$

$$x_{ext} = -\frac{b}{2a} \rightarrow x = \frac{-9}{2} \Rightarrow x = -4.5$$

$$y_{ext} = (-4.5)^2 + 9(-4.5) + 1 = -19.25$$

صورت سوال استباه نوشتی

$$\left. \begin{array}{l} x_{ext} = -\frac{b}{2a} \rightarrow x = \frac{-9}{2} \Rightarrow x = -4.5 \\ y_{ext} = (-4.5)^2 + 9(-4.5) + 1 = -19.25 \end{array} \right\} S \left| \begin{array}{l} -3 \\ -4 \end{array} \right.$$



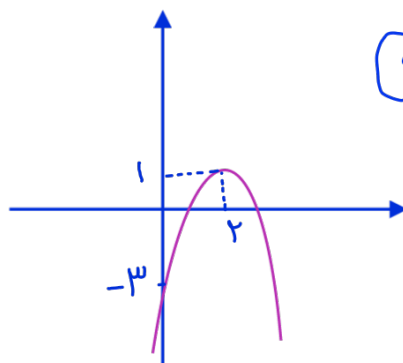
الف)

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

$$x_{ext} = \frac{-b}{2a} \rightarrow \frac{-4}{-2} = 2$$

$$y_{ext} = -(2)^2 + 4(2) - 3 = 1$$

} 5 | 1



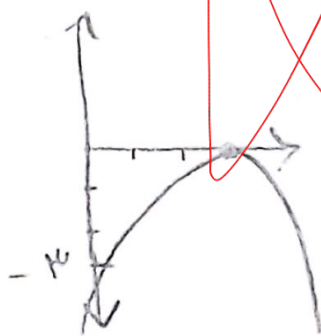
جواب سوال 9

$$\text{ج) } -x^2 + 4x - 3 = 0 \quad \begin{cases} x_1 = 1 \\ x_2 = 3 \end{cases}$$

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

$$\max \left\{ \begin{aligned} x &= \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ y &= -(2)^2 + 4(2) - 3 = -4 + 8 - 3 = 1 \end{aligned} \right.$$

$$y = -(2)^2 + 4(2) - 3 = -4 + 8 - 3 = 1$$



$$x = 2 \quad \text{0}$$

$$2x - 3x^2 = 0 \rightarrow -3x^2 + 2x + 0 = 0 \quad a = -3 \quad b = 2 \quad c = 0$$

$$x_1 + x_2 = \frac{-b}{a} = -\frac{2}{-3} = \frac{2}{3} \quad x_1 \times x_2 = \frac{c}{a} = \frac{0}{-3} = 0$$

$$p = 0 \quad S = \frac{2}{3} \quad S^2 - 2p = \left(\frac{2}{3}\right)^2 - 2(0) = \frac{4}{9}$$

$$S^3 - 3p = \left(\frac{2}{3}\right)^3 - 3(0) = \frac{8}{27}$$

$$x^2 - 3x - 2 = 0 \Rightarrow S = \frac{-b}{a} = \frac{3}{1} = 3 \quad p = \frac{c}{a} = \frac{-2}{1} = -2$$

$$\text{الف) } S^2 - 2p \Rightarrow (3)^2 - 2(-2) = 9 + 4 = 13$$

$$\text{ب) } S^3 - 3p \Rightarrow (3)^3 - 3(-2) = 27 + 6 = 33$$