

الف) $x^2 - 4x + 1 = 0$ $\xrightarrow{+1}$ $x^2 - 4x + 9 = 1 \Rightarrow (x-2)^2 = 1 \xrightarrow{\sqrt{\quad}}$ $x-2 = \pm 1$

$\begin{cases} x-2=1 \\ x=3 \end{cases}$
 $\begin{cases} x-2=-1 \\ x=1 \end{cases}$

ب) $x^2 + 8x + 7 = 0 \xrightarrow{+9}$ $x^2 + 8x + 17 = 9 \Rightarrow (x+4)^2 = 9 \xrightarrow{\sqrt{\quad}}$ $x+4 = \pm 3$

$\begin{cases} x+4=3 \\ x=-1 \end{cases}$
 $\begin{cases} x+4=-3 \\ x=-7 \end{cases}$

الف) $x^2 - 5x + 4 = 0 \rightarrow (x-2)(x-3) = 0 \Rightarrow \begin{cases} x=2 \\ x=3 \end{cases}$

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

الف) $x^2 - 3x - 5 = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4 \times 1 \times (-5)}}{2 \times 1}$

$= \frac{3 \pm \sqrt{29}}{2} \rightarrow \begin{cases} x = \frac{3 + \sqrt{29}}{2} \\ x = \frac{3 - \sqrt{29}}{2} \end{cases}$

ب) $2x^2 - 4x + 1 = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \times 2 \times 1}}{2 \times 2}$

$x = \frac{4 \pm \sqrt{12}}{4} \Rightarrow x = \frac{4 + 2\sqrt{3}}{4}, x = \frac{4 - 2\sqrt{3}}{4} \Rightarrow x = 1 + \frac{\sqrt{3}}{2}, x = 1 - \frac{\sqrt{3}}{2}$

الف) $x^2 - 3x + 2 = 0 \Rightarrow (x-2)(x-1) = 0 \Rightarrow \begin{cases} x=2 \\ x=1 \end{cases}$

ب) $x^2 + x - 2 = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{-1 \pm \sqrt{1 - 4 \times 1 \times (-2)}}{2 \times 1}$

$\Rightarrow x = \frac{-1 \pm \sqrt{9}}{2} \Rightarrow x = \frac{-1 + 3}{2}, x = \frac{-1 - 3}{2} = -1$

$a=1, b=1, c=-2$

الف) $x^2 - 12x + 35 = 0 \Rightarrow x^2 - 12x + 36 = 0 \Rightarrow \begin{cases} x = \frac{12}{2} \\ x = \frac{36}{2} = 18 \end{cases}$

$(x-6)(x-6) = 0$

ب) $3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 10x + 21 = 0 \Rightarrow \begin{cases} x = \frac{10}{2} = 5 \\ x = \frac{21}{2} = 10.5 \end{cases}$

$(x-3)(x-7) = 0$

الف) $-3x^2 + 5x - 1 = 0$ $\Delta: b^2 - 4ac \rightarrow \Delta = 25 - 12 = 13$ $\Delta > 0 \rightarrow$ چون دلتا مثبت است دو ریشه حقیقی نامبردار داریم

ب) $2x^2 - x + 1 = 0$ $\Delta: b^2 - 4ac \rightarrow \Delta = (-1)^2 - 8 = -7$ $\Delta < 0 \rightarrow$ چون دلتا منفی است معادله هیچ ریشه حقیقی ندارد

ج) $2x^2 - 4x + 2 = 0$ $\Delta: b^2 - 4ac \rightarrow \Delta = (-4)^2 - 16 = 0$ $\Delta = 0 \rightarrow$ چون دلتا صفر است معادله دقیقاً یک ریشه حقیقی دارد

د) $2x^2 - x + 1 = 0$ $\Delta: b^2 - 4ac \rightarrow \Delta = (-1)^2 - 8 = -7$ $\Delta < 0 \rightarrow$ چون دلتا منفی است معادله هیچ ریشه حقیقی ندارد

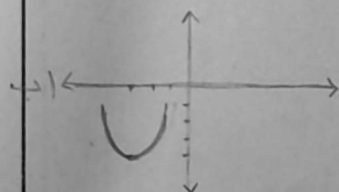
الف) $a=1 \Rightarrow 2x^2 - 3x + 1 = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{9 - 4}}{2} \Rightarrow x = 1, x = \frac{1}{2}$

ب) $a=\frac{9}{\lambda} \Rightarrow 2x^2 - 3x + \frac{9}{\lambda} = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{9 - 36/\lambda}}{2 \times \frac{9}{\lambda}} \Rightarrow x = \frac{3}{9}, x = \frac{3}{\lambda}$

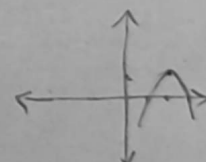
ج) $a=2 \Rightarrow 2x^2 - 3x + 2 = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{9 - 16}}{4} \Rightarrow \Delta < 0 \rightarrow$ معادله هیچ ریشه حقیقی ندارد

د) $a=1 \Rightarrow 2x^2 - 3x + 1 = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{9 - 4}}{2} \Rightarrow x = 1, x = \frac{1}{2}$

الف) $y = x^2 + 4x + 5$ $\Rightarrow$ نقاط $\left| \frac{b}{2a} = -\frac{4}{2 \times 1} = -2 \right|$ نقطه اوج $\Rightarrow y = 1^2 + 4 \times 1 + 5 = 10$



الف) $y = -x^2 + 4x - 3$ $\Rightarrow$ نقاط $\left| \frac{b}{2a} = -\frac{4}{2 \times (-1)} = 2 \right|$ نقطه اوج $\Rightarrow y = -1^2 + 4 \times 1 - 3 = 0$



الف) $0 = -x^2 + 4x - 3 \rightarrow x^2 - 4x + 3 = 0 \Rightarrow (x-1)(x-3) = 0 \rightarrow x_1 = 1, x_2 = 3$

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

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{9 + 8}}{2} \Rightarrow x = \frac{3 + \sqrt{17}}{2}, x = \frac{3 - \sqrt{17}}{2}$

الف) $5^2 - 2p = \frac{3 + \sqrt{17} + 3 - \sqrt{17}}{2} = \frac{6}{2} = 3 \Rightarrow 25 - 2p = 3 \Rightarrow 2p = 22 \Rightarrow p = 11$

ب) $(3)^2 - 2p = 9 - 2p = 22 + 9 = 31$