

$$x^2 - 4x + 11 = 0$$

$$x^2 - 4x + 9 = 1 \Rightarrow (x-3)^2 = 1 \Rightarrow x-3 = \pm 1$$

$$\Rightarrow x = 2, x = 4$$

$$x^2 + 11x + 17 = 0$$

$$x^2 + 11x + 17 = 9$$

$$(x+4)^2 = 9 \Rightarrow x+4 = \pm 3 \Rightarrow x = -1, x = -7$$

$$x^2 - 5x + 4 = 0$$

$$(x-1)(x-4) = 0 \Rightarrow x = 1, x = 4$$

$$x^2 - 5x - 14 = 0$$

$$(x-7)(x+2) = 0 \Rightarrow x = 7, x = -2$$

$$x^2 - 3x - 5 = 0 \quad a=1 \quad b=-3 \quad c=-5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{29}}{2}, x = \frac{3 + \sqrt{29}}{2}$$

$$2x^2 - 4x + \frac{1}{2} = 0 \quad a=2 \quad b=-4 \quad c=\frac{1}{2}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{4 \pm \sqrt{11}}{4} \Rightarrow x = 1 + \frac{\sqrt{11}}{4}, x = 1 - \frac{\sqrt{11}}{4}$$

$$x^2 - 3x + 2 = 0 \quad a+b+c=0 \quad \begin{cases} x=1 \\ x = \frac{c}{a} = 2 \end{cases}$$

$$4x^2 + x - 3 = 0 \quad a+c=b \quad \begin{cases} x=-1 \\ x = \frac{-c}{a} = \frac{3}{4} \end{cases}$$

$$5x^2 - 12x + 7 = 0$$

$$x^2 - 12x + 35 = 0 \Rightarrow (x-5)(x-7) = 0 \Rightarrow x = 5, x = 7$$

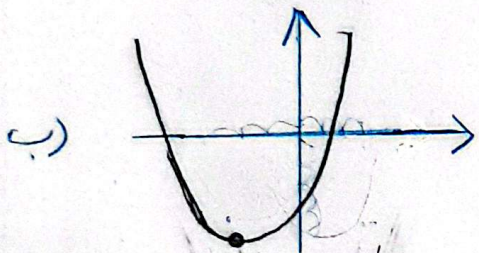
$$3x^2 - 10x + 7 = 0$$

$$x^2 - 10x + 21 = 0 \Rightarrow (x-3)(x-7) = 0 \Rightarrow x = 3, x = 7$$

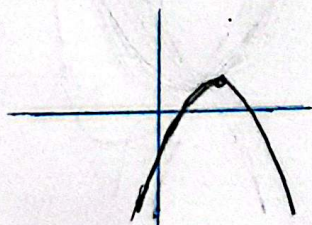
$$\begin{aligned}
 -3x^2 + 5x - 1 &= 0 \quad \Delta = 5^2 - (4 \times (-3) \times (-1)) = 25 - 12 = 13 \\
 &\quad \text{ریشه دارد} \\
 2x^2 - x + 2 &= 0 \quad \Delta = (-1)^2 - (4 \times 2 \times 2) = 1 - 16 = -15 \\
 &\quad \text{ریشه ندارد} \\
 2x^2 - 4x + 2 &= 0 \quad \Delta = (-4)^2 - (4 \times 2 \times 2) = 16 - 16 = 0 \\
 &\quad \text{ریشه دارد} \\
 2x^2 - x + 1 &= 0 \quad \Delta = (-1)^2 - (4 \times 2 \times 1) = 1 - 8 = -7 \\
 &\quad \text{ریشه ندارد}
 \end{aligned}$$

$$\begin{aligned}
 \text{الف} \quad & (-3)^2 - (4 \times 2 \times a) > 0 \Rightarrow 9 - 8a > 0 \Rightarrow 9 > 8a \Rightarrow a < \frac{9}{8} \quad \Delta > 0 \\
 \text{ب} \quad & (-3)^2 - (4 \times 2 \times a) = 0 \Rightarrow 9 - 8a = 0 \Rightarrow 8a = 9 \Rightarrow a = \frac{9}{8} \quad \Delta = 0 \\
 \text{ج} \quad & (-3)^2 - (4 \times 2 \times a) < 0 \Rightarrow 9 - 8a < 0 \Rightarrow 9 < 8a \Rightarrow a > \frac{9}{8} \quad \Delta < 0 \\
 \text{د} \quad & (-3)^2 - (4 \times 2 \times a) \geq 0 \Rightarrow 9 - 8a \geq 0 \Rightarrow 9 \geq 8a \Rightarrow a \leq \frac{9}{8} \quad \Delta \geq 0
 \end{aligned}$$

$$\begin{aligned}
 \text{الف} \quad & \text{Min} \quad y = x^2 + 4x + 5 \\
 & x_A = \frac{-b}{2a} \quad \text{نوع اکسترم: Min}
 \end{aligned}$$



$$\begin{aligned}
 \text{الف} \quad & \text{Max} \quad y = -x^2 + 4x - 3 \\
 & x_A = \frac{-b}{2a} = 2
 \end{aligned}$$



$$\begin{aligned}
 \text{ب} \quad & y = 0 \Rightarrow -x^2 + 4x - 3 = 0 \Rightarrow a + b + c = 0 \Rightarrow x = 1 \text{ و } 3
 \end{aligned}$$

$$\begin{aligned}
 \text{الف} \quad & S^2 - 2p \\
 & 3^2 - (2 \times 2) = 9 - 4 = 5 \\
 \text{ب} \quad & S^3 - 3Sp \\
 & 3^3 - (3 \times 3 \times 2) = 27 - 18 = 9
 \end{aligned}$$

$$\begin{aligned}
 x^2 - 3x - 2 &= 0 \\
 3 &= \frac{-b}{a} = 3 = \text{جمع ریشه ها} \\
 -2 &= \frac{c}{a} = p = \text{ضرب ریشه ها}
 \end{aligned}$$