

$$\textcircled{1} \quad x^2 - 4x + 1 = 0 \rightarrow x^2 - 4x = -1 \quad x^2 - 4x + 4 = -1 + 4$$

$$(x-2)^2 = 3 \Rightarrow x-2 = \pm\sqrt{3}$$

$$\Rightarrow x = 2 + \sqrt{3}, x = 2 - \sqrt{3}$$

$$\textcircled{2} \quad x^2 + 11x + 17 = 0 \quad x^2 + 11x = -17 \quad x^2 + 11x + 121 = -17 + 121$$

$$(x+11/2)^2 = 9 \Rightarrow x+11/2 = \pm 3$$

$$\Rightarrow x = -11/2 + 3, x = -11/2 - 3$$

$$\textcircled{1} \quad x^2 - 2x + 4 = 0 \rightarrow x^2 - 2x + 4 = (x-1)^2 + 3 = 0 \Rightarrow$$

$$(x-1)^2 = -3 \Rightarrow \text{no real solution}$$

$$\textcircled{2} \quad x^2 - 2x - 12 = 0 \rightarrow x^2 - 2x - 12 = (x+2)(x-6) = 0$$

$$\Rightarrow x = -2, x = 6$$

$$\textcircled{1} \quad x^2 - 3x - 2 = 0 \quad \Delta = (-3)^2 - 4(1)(-2) = 17$$

$$x = \frac{3 \pm \sqrt{17}}{2} \Rightarrow x = \frac{3 + \sqrt{17}}{2}, x = \frac{3 - \sqrt{17}}{2}$$

$$\textcircled{2} \quad 2x^2 - 5x + 1 = 0 \quad \Delta = (-5)^2 - 4(2)(1) = 9$$

$$x = \frac{5 \pm \sqrt{9}}{4} \Rightarrow x = \frac{5 + 3}{4}, x = \frac{5 - 3}{4}$$

$$\Rightarrow x = 2, x = \frac{1}{2}$$

$$\textcircled{1} \quad x^2 - 3x + 2 = 0 \rightarrow x^2 - 3x + 2 = (x-1)(x-2) = 0$$

$$\Rightarrow x = 1, x = 2$$

$$\textcircled{2} \quad 2x^2 + x - 3 = 0 \rightarrow (2x-3)(x+1) = 0$$

$$\Rightarrow x = \frac{3}{2}, x = -1$$

$$\textcircled{1} \quad x^2 - 12x + 35 = 0 \rightarrow x^2 - 12x + 35 = (x-5)(x-7) = 0$$

$$\Rightarrow x = 5, x = 7$$

$$\textcircled{2} \quad 2x^2 - 10x + 12 = 0 \rightarrow x^2 - 5x + 6 = (x-2)(x-3) = 0$$

$$\Rightarrow x = 2, x = 3$$

$$1 - 3x^2 + 2x - 1 = 0 \quad \Delta = 2^2 - 4(-3)(-1) = 1^2 \Delta > 0$$

$$1 - 3x^2 - x + 2 = 0 \quad \Delta = (-1)^2 - 4(-3)(2) = -1^2 \Delta < 0$$

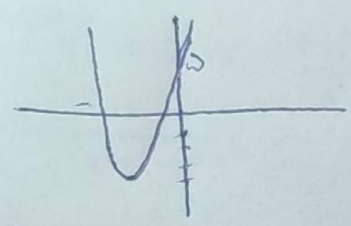
$$3 - 3x^2 - 4x + 2 = 0 \quad \Delta = (-4)^2 - 4(-3)(2) = 0 \Delta = 0$$

$$3 - 3x^2 - x + 1 = 0 \quad \Delta = (-1)^2 - 4(-3)(1) = -1^2 \Delta < 0$$

$$3x^2 - 3x + a = 0 \quad A = 3 \quad B = -3 \quad C = a \quad \Delta = (-3)^2 - 4(3)(a) =$$

$\Delta > 0 \rightarrow 9 - 12a > 0 \quad 9 > 12a \Rightarrow a < \frac{3}{4}$
 $\Delta = 0 \rightarrow 9 - 12a = 0 \quad 9 = 12a \Rightarrow a = \frac{3}{4}$
 $\Delta < 0 \rightarrow 9 - 12a < 0 \quad 9 < 12a \Rightarrow a > \frac{3}{4}$
 $\Delta \geq 0 \rightarrow 9 - 12a \geq 0 \quad a \leq \frac{3}{4}$

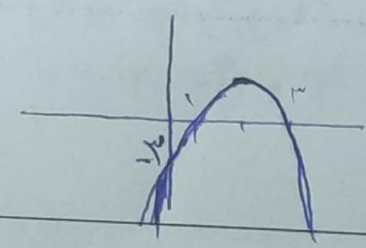
$$y = x^2 + 4x + 2 \quad x = -\frac{b}{2a} = -\frac{4}{2} = -2 \quad y = (-2)^2 + 4(-2) + 2 = -2$$



$$y = -x^2 + 4x - 3 \quad x = -\frac{b}{2a} = -\frac{4}{-2} = 2 \quad y = (-2)^2 + 4(2) - 3 = 1$$

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

نقاط (1,0), (3,0) روی محور x ها قرار می گیرند



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

$$S = -\frac{b}{a} \rightarrow -\frac{-3}{1} = 3$$

$$P = \frac{c}{a} = \frac{-2}{1} = -2$$

$$S^2 - 2P = 9 - 2(-2) = 13$$

$$S^2 - 3SP = 9 - 3(3)(-2) = 27$$