

$$y = -x^2 + bx + c$$

$$y_{max} = \frac{-\Delta}{4a} = \frac{-b^2 + 4ac}{4a} = \frac{-b^2 + 4(-1)(c)}{4(-1)} = \frac{-b^2 - 12}{-4} = \frac{b^2 + 12}{4} = 7 \rightarrow b^2 + 12 = 28$$

$$b^2 = 16 \rightarrow b = \pm 4$$

$$b = +4 \rightarrow y = -x^2 + 4x + c \xrightarrow{\Delta = b^2 - 4ac} \Delta = 16 - 4(-1)(c) > 0 \quad \text{قب}$$

$$b = -4 \rightarrow y = -x^2 - 4x + c \xrightarrow{\Delta = b^2 - 4ac} \Delta = 16 - 4(-1)(c) > 0 \quad \text{قب}$$

$$\text{الف) } x^2 + 2x + 3 = 0 \xrightarrow{x_1 = t} t^2 + 2t + 3 = 0 \xrightarrow{\Delta = b^2 - 4ac} \Delta = 4 - 4(1)(3) < 0 \quad \text{عبارت هواره و منفی در بازه}$$

$$\rightarrow f(x) = (c - x^2)^2 - 2(c - x^2) - 1 \xrightarrow{c - x^2 = t} t^2 - 2t - 1 = 0 \rightarrow (t - 3)(t + 1) = 0$$

$$\left\{ \begin{array}{l} t = 3 \rightarrow c - x^2 = 3 \rightarrow x^2 + 1 = 0 \rightarrow \Delta < 0 \quad \text{عبارت هواره و مثبت در بازه} \\ t = -1 \rightarrow c - x^2 = -1 \rightarrow x^2 - 5 = 0 \rightarrow x^2 = 5 \rightarrow x = \pm \sqrt{5} \end{array} \right.$$

$$cx^2 - 14x + m = 0$$

$$\left. \begin{array}{l} \alpha = \beta + 2 \rightarrow \alpha - \beta = 2 \\ \alpha + \beta = \frac{-b}{a} = \frac{14}{c} = 4 \end{array} \right\} \rightarrow \left\{ \begin{array}{l} \alpha - \beta = 2 \\ \alpha + \beta = 4 \end{array} \right. \rightarrow \alpha = 3 \rightarrow \beta = 1$$

$$\xrightarrow{x = \alpha = 3} \frac{c}{c} (3)^2 - 14 \left(\frac{3}{c} \right) + m = 0 \rightarrow -12 + m = 0 \rightarrow m = 12$$

$$3\alpha^2 - 4\alpha + m - 1 = 0 \quad S = \alpha + \beta = \frac{-b}{a} \rightarrow S = \frac{+4}{3} = 2$$

$$\left\{ \begin{array}{l} 3\alpha - \beta = 4 \\ \alpha + \beta = 2 \end{array} \right. \xrightarrow{+} 4\alpha = 6 \rightarrow \alpha = \frac{3}{2} \quad \xrightarrow{x = \alpha = \frac{3}{2}} 3 \left(\frac{3}{2} \right)^2 - 4 \left(\frac{3}{2} \right) + m - 1 = 0$$

$$\rightarrow m - 1 = 0 \rightarrow m = 1$$

$$-mx^2 + cx + m^2 - 2 = 0 \quad p = \alpha\beta = 1 \rightarrow \frac{c}{a} = 1$$

$$\frac{c}{a} = \frac{m^2 - 2}{-m} = 1 \rightarrow m^2 - 2 = -m \rightarrow m^2 + m - 2 = 0 \rightarrow (m + 2)(m - 1) = 0 \rightarrow \left\{ \begin{array}{l} m = -2 \\ m = 1 \end{array} \right. \quad \text{قب}$$

$$m = -2 \rightarrow 2x^2 + cx + 2 = 0 \rightarrow x^2 + 2x + 1 = 0 \rightarrow (x + 1)^2 = 0 \rightarrow x = -1$$

$$m = 1 \rightarrow -x^2 + cx - 1 = 0 \xrightarrow{\Delta = b^2 - 4ac} \Delta = 16 - 4(-1)(-1) > 0 \rightarrow \Delta > 0 \quad \text{در شرایط مناسب}$$

$$\rightarrow m = 1$$

$$x^r - mx + r = 0 \rightarrow p = \frac{c}{a} \rightarrow \alpha \cdot \beta = r$$

$$\alpha \beta^r = r \rightarrow (\alpha \beta) \beta = r \rightarrow \beta = \frac{r}{\alpha}$$

$$\underline{x = \beta \cdot \frac{r}{\alpha}} \quad \left(\frac{r}{\alpha}\right)^r - m \left(\frac{r}{\alpha}\right) + r = 0 \rightarrow \frac{19}{9} - \frac{r \cdot 5m}{r \cdot r} + \frac{9 \cdot r}{r \cdot 1} = 0 \rightarrow \frac{19 - 12m + 9r}{9} = 0$$

$$\rightarrow -12m + 9r = 0 \rightarrow m = \frac{3r}{4}$$

$$x^r - rx + m = 0 \rightarrow S = \frac{-b}{a} \rightarrow \alpha + \beta = r \rightarrow r\beta = r \rightarrow \beta = 1$$

$$\alpha = r\beta$$

$$\underline{x = \beta = 1} \rightarrow (1)^r - r(1) + m = 0 \rightarrow 1 - r + m = 0 \rightarrow m = r$$

$$x^r - vx + r = 0 \quad p = \frac{c}{a} \rightarrow \alpha \beta = r \rightarrow \beta = \frac{r}{\alpha} \rightarrow \beta^r = \frac{r}{\alpha^r}$$

$$\alpha^r + \frac{1}{\alpha^r} = ? \rightarrow \alpha^r + \frac{1}{\alpha^r} = \left(\alpha + \frac{r}{\alpha}\right) \left(\alpha^r - r + \frac{r}{\alpha^r}\right) \rightarrow \frac{v}{\alpha + \beta} \left(\alpha^r + \beta^r - r\right)$$

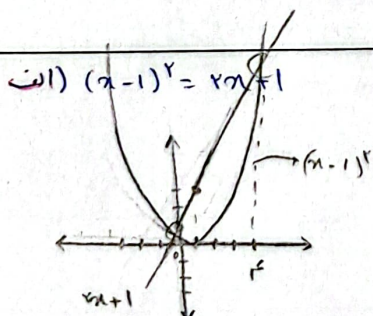
$$S = \frac{-b}{a} \rightarrow \alpha + \beta = v$$

$$\alpha^r + \beta^r = S^r - rp = (v)^r - r \left(\frac{r}{v}\right) = r$$

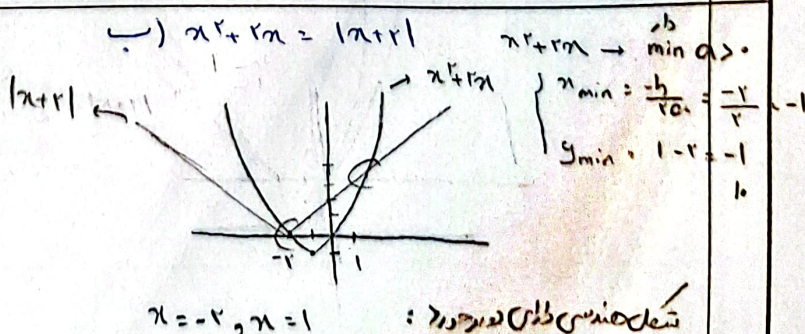
$$h(t) = -1 \cdot t^r + a \cdot t \quad h(t) = 0 \rightarrow -1 \cdot t^r + a \cdot t = 0 \rightarrow -t^r + at = 0 \rightarrow t(-t + a) = 0$$

$$\begin{cases} \text{نقطه } \max : t_{max} = \frac{-b}{2a} \rightarrow t_{max} = \frac{a}{r} = r, a \end{cases}$$

$$\begin{cases} \text{نقطه } \max : h_{max} = \frac{(-b)^2 - 4ac}{4a} \rightarrow h_{max} = \frac{f(x_0) \cdot x(0)}{r \cdot x(x_0)} = \frac{1 \cdot a}{r} = a, r \end{cases}$$



$x=0, x=r$
نقطه های تقاطع منحنی و خط مستقیم



$x=-r, x=1$
نقطه های تقاطع منحنی و خط مستقیم