

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

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

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

الف) $f(x) = x^2 + 2x + 3 \xrightarrow{x=-x^2} x^2 + 2x + 3 = 0 \xrightarrow{\Delta 40}$ ریشه (صفر) ندارد!

ب) $f(x) = (x-x^2)^2 - 2(x-x^2) - 10 \xrightarrow{x-x^2=t} t^2 - 2t - 10 = 0 \rightarrow (t-5)(t+3) = 0$

$$\Rightarrow t \begin{cases} \rightarrow 5 = x - x^2 \rightarrow 1 = -x^2 \quad \times \\ \rightarrow -3 = x - x^2 \rightarrow -7 = -x^2 \rightarrow x^2 = 7 \rightarrow x = \pm\sqrt{7} \end{cases}$$

$$x^2 - 19x + m = 0 \quad a, a+2 \xrightarrow{\text{جوابها}} (1), (3)$$

$$S = \frac{b}{a} = \epsilon = a + a + 2 \rightarrow 2 = 2a \Rightarrow a = 1$$

$$P = \frac{c}{a} = \frac{m}{\epsilon} = 3 \rightarrow m = 12$$

$$\begin{cases} x^2 - 9x + m - 1 = 0 & 2\alpha - \beta = \epsilon \end{cases} \Rightarrow \begin{cases} 2\alpha - \beta = \epsilon & \oplus \\ \alpha + \beta = 2 \end{cases} \xrightarrow{\oplus} 3\alpha = \epsilon \rightarrow \alpha = \frac{\epsilon}{3}$$

$$S = \frac{b}{a} = 2 = \alpha + \beta \xrightarrow{\alpha = \frac{\epsilon}{3}} \epsilon - \beta = \epsilon \rightarrow \beta = 0$$

$$P = \frac{c}{a} = 0 \rightarrow \frac{m-1}{3} = 0 \rightarrow m-1=0 \rightarrow m=1$$

$$-mx^2 + \epsilon x + m - 2 = 0$$

معین (فروض است) ریشه های $\frac{1}{4}$ و $\frac{9}{\epsilon}$ را داشته باشد $\Rightarrow \frac{c}{a} = 1 \rightarrow \frac{m-2}{-m} = 1 \rightarrow m+m-2=0$

$$(m+2)(m-1)=0 \Rightarrow m = \begin{cases} -2 \\ 1 \end{cases} \checkmark \Rightarrow m=1$$

$$\begin{cases} x^2 - mx + 3 = 0 & \alpha, \beta & \alpha\beta = \epsilon \end{cases} \Rightarrow \beta = \frac{\epsilon}{\alpha} \rightarrow \alpha \frac{\epsilon}{\alpha} = \frac{9}{\epsilon} \rightarrow \alpha = \frac{9}{\epsilon}$$

$$P = \frac{c}{a} = 3 \rightarrow \alpha\beta = 3$$

$$S = \frac{b}{a} = m \rightarrow \alpha + \beta = \frac{9}{\epsilon} + \frac{\epsilon}{3} \rightarrow \frac{27}{12} + \frac{12}{12} = \frac{39}{12}$$

$$K^2 - EK + m = 0 \quad \alpha, 3\alpha$$

(7)

$$S = \frac{b}{a} = E = \alpha + 3\alpha \rightarrow \alpha = 1$$

$$P = \frac{c}{a} = m \rightarrow \alpha \times 3\alpha = m \rightarrow 3\alpha^2 = m \Rightarrow m = 3$$

$$K^2 - VK + r = 0 \quad \alpha^2 + \frac{1}{\alpha^2} \quad \alpha, \beta$$

(1)

$$S = \frac{b}{a} = V \rightarrow \alpha^2 + \beta^2 = S - 3P \rightarrow 3\alpha^2 - 4\alpha = +301$$

$$P = \frac{c}{a} = r \rightarrow \alpha \cdot \beta = r \xrightarrow{r=0} (\alpha\beta)^2 = 1$$

$$\Rightarrow (\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2\alpha\beta = 301 \Rightarrow \alpha^2 + \beta^2 + 2\alpha\beta = 301$$

$$\Rightarrow \alpha^2 + \frac{1}{\alpha^2} \rightarrow \alpha^2 + \left(\frac{1}{\alpha}\right)^2 \xrightarrow{r=\alpha P} \alpha^2 + \left(\frac{\alpha P}{\alpha}\right)^2 \rightarrow \alpha^2 + \beta^2 = 301$$

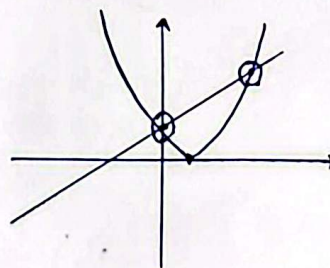
$$\text{ارتفاع ماکسیم} = \max \rightarrow \frac{d}{dx} = \frac{-(12500)}{-50} = \left(\frac{125}{5}\right)$$

$$h(x) = -10x^2 + 500x$$

(9)

$$\text{نقطه برش در ربع اول} = \text{ریشه} \rightarrow -10x^2 + 500x = 0 \rightarrow x \begin{cases} 0 \\ 50 \end{cases} \rightarrow \text{نقطه اول ربع اول} = x$$

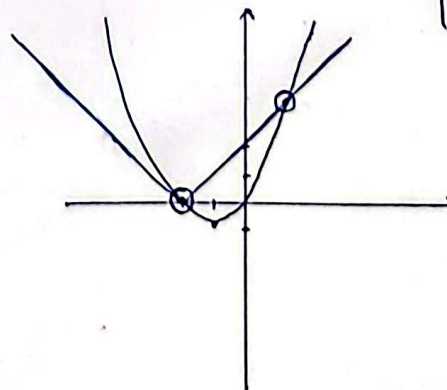
$$\text{الف) } (K-1)^2 = 2K + 1$$



$$\begin{cases} K=0 \rightarrow Y=1 \\ K=5 \rightarrow Y=9 \end{cases}$$

(10)

$$\text{ب) } K^2 + 2K = |K+2|$$



$$\begin{cases} K=-2 \rightarrow Y=0 \\ K=1 \rightarrow Y=0 \end{cases}$$