

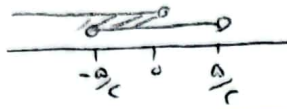
$$y = (a-1)x^2 + x + 3 \quad \text{معرفة: } x=2$$

$$\frac{-b}{2a} = \frac{-1}{2(a-1)} = 2 \Rightarrow 4a - 4 = -1 \Rightarrow 4a = 3 \Rightarrow a = \frac{3}{4}$$

$$y = -\frac{1}{4}x^2 + x + 3 \xrightarrow{y=0} x^2 - 4x - 12 = 0 \Rightarrow (x-6)(x+2) = 0 \Rightarrow \begin{cases} x=6 \\ x=-2 \end{cases}$$

$$f(x) = mx^2 - \omega x + m \quad \text{بشرط: } \begin{cases} \Delta > 0 \\ m < 0 \end{cases} \rightarrow \text{منحنى جرس}$$

$$\Delta = 4\omega - 4(m)(m) = 4\omega - 4m^2 > 0 \rightarrow 4m^2 < 4\omega \Rightarrow m^2 < \frac{\omega}{1} \rightarrow |m| < \frac{\omega}{1} \Rightarrow -\frac{\omega}{1} < m < \frac{\omega}{1}$$



$$\rightarrow m \text{ مدور: } -\frac{\omega}{1} < m < \frac{\omega}{1} \rightarrow (-\frac{\omega}{1}, \frac{\omega}{1})$$

$$\alpha = \frac{2-\sqrt{5}}{1}, \beta = \frac{2+\sqrt{5}}{1}$$

$$S = \alpha + \beta = \frac{2-\sqrt{5}}{1} + \frac{2+\sqrt{5}}{1} = 4$$

$$p = \alpha \cdot \beta = \frac{1}{1} (2-\sqrt{5})(2+\sqrt{5}) = \frac{1}{1} (4-5) = -1 \Rightarrow x^2 - 4x - 1 = 0 \Rightarrow$$

$$x^2 - 4x - 1 = 0$$

$$x^2 - 4x + m + 4 = 0 \quad \alpha + \beta = 4, \alpha \cdot \beta = \frac{m+4}{1}$$

$$x^2 - 4x + 12 = 0 \rightarrow x^2 - 4x + \alpha^2 + \beta^2 = 12 \rightarrow x^2 - 4x + 14 - 2x(\frac{m+4}{x}) = 12 \rightarrow x^2 - 4x + 14 - 2m - 8 = 12 \rightarrow x^2 - 4x + 6 - 2m = 12 \rightarrow x^2 - 4x - 6 + 2m = 0$$

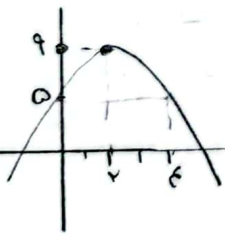
$$x^2 - 4x - 6 + 2m = 0 \rightarrow x^2 - 4x = 6 - 2m \rightarrow x(x-4) = 6 - 2m \rightarrow x = \frac{6-2m}{x-4}$$

$$\alpha + \beta = 4 \rightarrow \beta = 4 - \alpha \rightarrow \alpha \cdot \beta = \alpha(4 - \alpha) = \frac{m+4}{1} = 4\alpha + 1 \rightarrow 4\alpha - \alpha^2 = 4\alpha + 1 \Rightarrow -\alpha^2 = 1 \Rightarrow \alpha = \pm 1$$

$$\alpha^2 - 4\alpha + 1 = 0 \rightarrow (\alpha-1)^2 = 0 \rightarrow \alpha = 1, m = 4$$

$$\beta = 3$$

$$S(2, 9), (0, 5), (4, 5) \quad y = ax^2 + bx + c \quad (0, 5) \rightarrow c = 5$$



$$(2, 9) \rightarrow 9 = 4a + 2b + 5 \rightarrow 4a + 2b = 4 \rightarrow 2(2a + b) = 4 \rightarrow 2a + b = 2$$

$$(4, 5) \rightarrow 5 = 16a + 4b + 5 \Rightarrow 16a + 4b = 0 \Rightarrow 4a + b = 0$$

$$\begin{cases} 2a + b = 2 \\ 4a + b = 0 \\ -2a = -2 \end{cases}$$

$$-2a = -2 \rightarrow a = 1, b = -2 \rightarrow y = -x^2 + 4x + 5$$

$$y=0 \rightarrow x^2 - 4x - 5 = 0 \rightarrow (x-5)(x+1) = 0 \rightarrow \begin{cases} x=-1 \\ x=5 \end{cases} \rightarrow (-1, 0) \text{ and } (5, 0)$$

$$x^2 - 4x + 9\beta = 0 \quad \beta > 0 \quad \frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{-\frac{4}{\alpha}}{\frac{9\beta}{\alpha}} = -\frac{4}{9\beta}$$

$$S = -\frac{4}{\alpha}, P = \frac{9\beta}{\alpha}$$

$$\alpha\beta = \frac{4\beta}{\alpha} \Rightarrow \alpha = \pm 1$$

$$\alpha = -1, \beta = \frac{1}{9}$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{4}{9}$$

$$x^2 + mx - 1m = 0 \quad \alpha^2 - m\beta = 1$$

$$\alpha + \beta = 0$$

$$\alpha + \beta = -m = 5, \quad p = -1m$$

$$\alpha + \beta = -m \quad 1m + m^2 = 1$$

$$m \left\{ \begin{array}{l} -1 \\ 1 \end{array} \right\} \begin{array}{l} D < 0 \times \\ D > 0 \checkmark \end{array} \rightarrow S = -m = -1$$

$$\begin{cases} \alpha + \beta = -m \rightarrow \beta = -m - \alpha \\ \alpha \cdot \beta = -1m \Rightarrow \alpha(-m - \alpha) = -1m \Rightarrow -m\alpha - \alpha^2 = -1m \Rightarrow \end{cases}$$

$$\alpha^2 + m\alpha - 1m = 0 \Rightarrow \alpha^2 + m\beta = 1m \Rightarrow \alpha^2 = 1m - m\beta$$

$$\alpha^2 - m\beta = 1 \rightarrow 1m - \underbrace{m\beta}_{-1m\beta} = 1 \rightarrow 1m(1 - \beta) = 1 \rightarrow$$

$$m(1 - \beta) = 1 \rightarrow m = \frac{1}{1 - \beta}$$

$$\beta = -m - \alpha \rightarrow \beta = \frac{-1}{1 - \beta}$$

$$f(x) = mx^2 + 1x + \frac{m}{1} + 1$$

$$m < 0$$

$$14 - 1m^2 - 1m$$



$$\Delta_S = 1 \quad \Delta_S = \frac{-\Delta}{fa} = - \frac{(14 - 1m^2 - 1m)(\frac{m}{1} + 1)}{1m} = 1$$

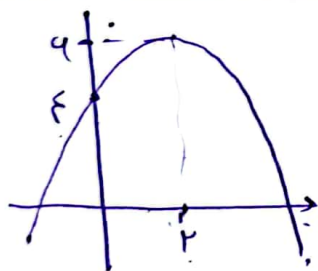
$$\frac{1m^2 + 14m - 14}{1m} = \frac{1m^2 + 14m - 14}{1m \times 1} = 1$$

$$f(m) = -1m^2 + 14m + 1$$

$$x = -1, 1, 2$$

$$k = 10$$

$$m^2 + 14m - 14 = 14m \rightarrow m^2 - 1m - 14 = 0 \rightarrow (m - 1)(m + 14) = 0 \rightarrow \begin{cases} m = 1 \\ m = -14 \end{cases}$$



$$(0, 1), (1, 4)$$

$$y = ax^2 + bx + c \rightarrow c = 1$$

$$y = ax^2 + bx + 1 \rightarrow \Delta_S = \frac{-b}{1a} = 1 \rightarrow -b = 1a \rightarrow b = -a$$

$$y = ax^2 - 1ax + 1$$

$$a = -1$$

$$21^2 - 1x - 1$$

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{1}$$

$$\frac{1}{2} (1)$$