

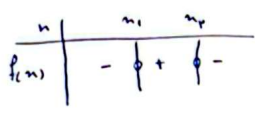
سوال 1) <

$$y = (a-1)x^2 + x + 1, \quad x = 2$$

$$x = \frac{-b}{2a} = \frac{-1}{2(a-1)} \rightarrow \frac{-1}{2(a-1)} = 2 \quad -1 = 4a - 8 \quad a = \frac{7}{4}$$

$$y = -\frac{1}{4}x^2 + x + 1 \xrightarrow{x=2} x^2 - 4x + 4 = 0 \quad \boxed{x = 4} \quad x = -2$$

$$f(x) = mx^2 - \omega x + m$$



$$\Delta > 0 \Rightarrow 4\omega^2 - 4m^2 > 0 \Rightarrow m^2 < \frac{\omega^2}{4} \Rightarrow |m| < \frac{\omega}{2} \Rightarrow -\frac{\omega}{2} < m < \frac{\omega}{2}$$

سوال 2) <

$$\text{استنتاج} \Rightarrow \boxed{-\frac{\omega}{2} < m < 0}$$

$$\text{ریشه های مساوی} \Rightarrow \frac{3-\sqrt{5}}{4}, \frac{3+\sqrt{5}}{4}$$

سوال 3) <

$$S = x_1 + x_2 = \frac{3-\sqrt{5}}{4} + \frac{3+\sqrt{5}}{4} = 3 \quad P = x_1 x_2 = \frac{3-\sqrt{5}}{4} \times \frac{3+\sqrt{5}}{4} = \frac{9-5}{16} = \frac{1}{4}$$

$$x^2 - Sx + P = 0 \Rightarrow x^2 - 3x + \frac{1}{4} = 0 \xrightarrow{\times 4} 4x^2 - 12x + 1 = 0$$

$$2x^2 - \alpha x + m + 1 = 0, \quad \alpha < \beta, \quad 2\alpha + \beta = 12$$

سوال 4) <

$$S = 7, \quad P = \frac{m+7}{2}$$

$$\alpha + \beta = 7 \Rightarrow \beta = 7 - \alpha$$

$$2\alpha + \beta = 12 \Rightarrow 2\alpha + (7 - \alpha) = 12 \Rightarrow \alpha = 5$$

$$4\alpha^2 + \alpha^2 - 12\alpha + 19 - 12 = 0$$

$$5\alpha^2 - 12\alpha + 7 = 0$$

$$\alpha^2 - 2\alpha + 1 = 0 \Rightarrow (\alpha - 1)^2 = 0 \Rightarrow \alpha = 1$$

$$\beta = 7 - \alpha = 7 - 1 = 6$$

$$P = \alpha\beta = 6 \Rightarrow \frac{m+7}{2} = 6 \Rightarrow m = 5$$

$$S = \frac{1}{\alpha} + \frac{1}{\beta}$$

سوال 5) <

$$y = a(x-h)^2 + k \rightarrow y = a(x-4)^2 + 9$$

$$(0, 9) \quad 0 = a(\omega - 4)^2 + 9$$

$$9a + 9 = 0 \rightarrow a = -1$$

$$y = -(x-4)^2 + 9$$

$$y > 0 \rightarrow -(x-4)^2 + 9 > 0 \rightarrow (x-4)^2 < 9$$

$$\boxed{-1 < x < 7}$$

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

سوال 6) <

$$S = \alpha + \beta = \frac{\nu}{\alpha}, \quad P = \alpha\beta = \frac{9\beta}{\alpha} \rightarrow \alpha^2\beta = 9\beta$$

$$\beta > 0, \alpha^2 = 9 \rightarrow \alpha = \pm 3$$

$$\alpha = 3 \rightarrow 3 + \beta = \frac{\nu}{3} \rightarrow \beta = \frac{\nu}{3} - 3$$

$$\boxed{\alpha = -3} \rightarrow -3 + \beta = \frac{\nu}{-3} \rightarrow \beta = \frac{\nu}{-3} + 3$$

$$\Rightarrow \alpha = -3, \beta = \frac{\nu}{-3}$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{-1}{3} + \frac{-3}{\nu} = \frac{\nu}{4}$$

$$x^2 + mx - 4m = 0 \quad x^2 - m/3 = 1$$

$$x^2 + mx - 4m = 0$$

$$S = \alpha + \beta = -m$$

$$P = \alpha\beta = -4m$$

$$\alpha^2 = -m\alpha + 4m$$

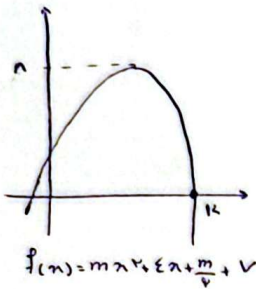
$$\alpha^2 - m/3 = 1 \rightarrow (-m\alpha + 4m) - m/3 = 1$$

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

$$m = -4 \rightarrow \Delta < 0 \text{ قبول نمی شود}$$

$$m = 4 \rightarrow \Delta > 0 \text{ قبول می شود}$$

$$S = \alpha + \beta = -m \rightarrow S = -4$$



$$n = \frac{-b}{2a} = \frac{-4}{2m} = \frac{-2}{m}$$

$$f(x) = m\left(\frac{-2}{m}\right)^2 + 4\left(\frac{-2}{m}\right) + 4 = 1$$

$$\frac{-4}{m} + \frac{4}{m} + 4 = 1 \rightarrow \frac{-4 + 4 + 4m}{m} = 1$$

$$m^2 - 4m - 4 = 0 \rightarrow m = 4 \rightarrow m = -4$$

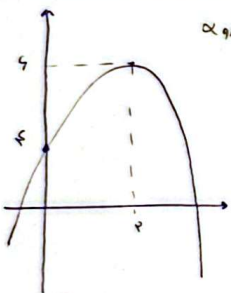
برای شکل تابع همیشه منفی است پس غلط است

$$m = -4 \rightarrow -4x^2 + 4x + 4$$

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

$$(x+1)(x-4) = 0 \rightarrow x = \frac{-4}{-1} = 4, x = \frac{4}{-4} = -1$$

ک، ریشه مثبت تابع است



ریشه α, β

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{-b/a}{c/a} = -\frac{b}{c}$$

$$y = a(x-h)^2 + k \rightarrow y = a(x-v)^2 + 4$$

$$(0, f) \rightarrow f = a(0-v)^2 + 4$$

$$f = fa + 4 \rightarrow a = \frac{-f}{v}$$

$$y = \frac{-f}{v}(x-v)^2 + 4 \rightarrow \frac{-f}{v}x^2 + 2fx + f + 4 = 0$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = -\frac{b}{c} = \frac{-2f}{f} = -\frac{1}{v}$$

$$x^2 - (fa + f)x + (4a^2 + fa + 4) = 0$$

$$\alpha, \beta \text{ ریشه}, \alpha = v$$

$$S = \alpha + \beta = fa + f \xrightarrow{\alpha=v} \beta = fa + v$$

$$P = \alpha\beta = 4a^2 + fa + 4 \xrightarrow{\alpha=v} v(fa + v) = 4a^2 + fa + 4$$

$$4av - va - 4 = 0$$

$$4v - va - 4 = 0 \rightarrow a = \frac{-1}{v} \quad a = 1$$

$$a = 1 \rightarrow x^2 - 4x + 4 = 0 \Rightarrow x = 2 \text{ (۴)}$$

$$a = \frac{-1}{v} \rightarrow x^2 - \frac{1}{v}x + \frac{4}{v} = 0$$

$$vx^2 - x + 4 = 0 \Rightarrow x = \left(\frac{v}{4}\right)^2$$

$$x = 4 \leq \frac{v}{4}$$