

سوال ۱) $P = \alpha \cdot \beta = \frac{c}{a} = \frac{2}{1} \rightarrow \alpha \cdot \beta = 2 \rightarrow \alpha = \frac{2}{\beta} \rightarrow \alpha^2 = \frac{4}{\beta^2} \quad S = \alpha + \beta = \frac{-b}{a} = \frac{-(-4)}{1} = 4$

$$\frac{\alpha^2 + \beta^2}{\alpha \beta^2} = \frac{\alpha^2}{\alpha \beta^2} + \frac{\beta^2}{\alpha \beta^2} = \frac{\alpha^2}{\alpha} \cdot \frac{1}{\beta^2} + \frac{\beta^2}{\alpha} = \frac{\alpha^2 + \beta^2}{\alpha} = \frac{(\alpha + \beta)^2 - 2\alpha\beta}{\alpha} = \frac{4^2 - 2(2)}{4} = \frac{16 - 4}{4} = \frac{12}{4} = 3$$

سوال ۲) $\begin{vmatrix} 3 & -1/4 \\ -2 & -2 \end{vmatrix} \rightarrow \text{مورد ستان: } \frac{3 + (-1/4)}{2} = \frac{11}{8} \quad \frac{-b}{2a} = \frac{3}{4}$
 $x = \frac{11}{8} \Rightarrow \frac{-b}{2a} = \frac{3}{4} \quad \text{طول ای می (که روی محور ستان است)} \quad S = \frac{-b}{a} = ? \rightarrow \frac{3}{4} \times 2 = \frac{3}{2}$

سوال ۳) اختلاف: $\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{\Delta}}{1 \cdot 1} = \frac{4}{3} k$
 $x_{1,2} = \frac{-2k \pm \sqrt{\Delta}}{2 \times 1} = \frac{-2k \pm \frac{4}{3}k}{2} \rightarrow \begin{cases} -\frac{2}{3}k \\ -\frac{1}{3}k \end{cases} \quad P = \frac{c}{a} = 4 = \frac{-2}{3}k \times \frac{-1}{3}k = \frac{2}{9}k^2 \rightarrow k^2 = 9$
 $\left[\frac{k^2}{9}\right] = \left[\frac{9}{9}\right] = 1$

سوال ۴) $\begin{vmatrix} 3 & -1 \\ y & y \end{vmatrix} \rightarrow \text{مورد ستان: } x = \frac{3-1}{2} = 1 \rightarrow \text{طول ای می} \rightarrow S = 1$
 $\frac{-b}{2a} = -1 \rightarrow S = \frac{-b}{a} = -1 \times 2 = -2 \quad \alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = (-2)^2 - 2\alpha\beta = 4 \rightarrow -2\alpha\beta = 1 \rightarrow P = \alpha\beta = -\frac{1}{2}$
 $y = a(x^2 - 5x + p) \rightarrow y = a(x^2 + 2x - \frac{1}{2}) \xrightarrow{|-1|} 1 = a(1 - 2 - \frac{1}{2}) \rightarrow a = -\frac{2}{3}$
 $y = -\frac{2}{3}x^2 - \frac{4}{3}x + \frac{1}{3}$
 نقطه $(0, \frac{1}{3})$ $x=0 \quad y = \frac{1}{3}$

سوال ۵) $\Delta > 0 \rightarrow b^2 - 4ac = 2d - 4(-1)(m) = 2d + 4m > 0 \rightarrow m > -\frac{2d}{4} \rightarrow -\frac{d}{2}$
 $x_1 = \frac{-d + \sqrt{2d+4m}}{-2} < \frac{9}{2} \rightarrow \sqrt{2d+4m} > -4$
 $x_2 = \frac{-d - \sqrt{2d+4m}}{-2} < \frac{9}{2} \rightarrow \sqrt{2d+4m} < 4 \rightarrow 0 < 2d+4m < 16$
 $-4 < m < 4$
 $2d+4m < 16 \quad -4 < m < 4$
 $m < -\frac{2d}{4}$
 مجموعه: $\{-4, -d, -4, -4\}$
 (۴)

سوال ۶) فرض رأس می: $\frac{-\Delta}{4a} = 2 \rightarrow \frac{-144 + 4m(\omega m - 1)}{4m} = \frac{40m^2 - 4m - 144}{4m} = 2 \rightarrow 40m^2 - 12m - 144 = 0$
 $4(10m^2 - 3m - 36) = 0 \rightarrow 10m^2 - 3m - 36 = 0$
 $\Delta = b^2 - 4ac = 9 - 4(10)(-36) = 1449 \quad x_{1,2} = \frac{3 \pm \sqrt{1449}}{20} = \frac{3 \pm 38}{20} \rightarrow \begin{cases} 4 \quad (m > 0) \rightarrow \text{Min} \\ -2, 4 \end{cases}$
 $y = 10x^2 - 12x + 144$
 محور ستان: $x = \frac{-b}{2a} = \frac{-(-12)}{20} = \frac{3}{5} \rightarrow \boxed{x = 2}$

$$a^r = \alpha \cdot \beta \rightarrow P = \alpha \cdot \beta = \frac{c}{a} = \frac{ra-1}{1} \rightarrow a^r = ra-1 \rightarrow a^r - ra + 1 = 0$$

سوال (۷)

$$(a-1)^r = 0 \rightarrow a=1$$

$$\Delta = b^r - 4ac = 4a^r + 4a + 4 - 4(1)(ra-1) = 4a^r + 4 > 0 \quad \checkmark$$

$$x^r - vx^r - \omega = 0 \quad x^r = t \rightarrow t^r - vt - \omega = 0$$

$$\Delta = (-v)^r - 4(1)(-\omega) = 49 + 40 = 89$$

سوال (۸)

$$x^r = \frac{v \pm \sqrt{49}}{v} \rightarrow x = \pm \sqrt{\frac{v \pm \sqrt{49}}{v}}$$

$$t_{1,2} = \frac{v \pm \sqrt{49}}{v} \rightarrow \text{منفی قابل تبدیل نیست}$$

چون $t=x^r$ ، $t=x^r$ نامنفی است

$$S=0, \quad P = -\frac{(v \pm \sqrt{49})}{v}$$

$$2P^r - 3SP + 2S = 2P^r \rightarrow 2 \left(\frac{49 + v \pm \sqrt{49}}{v} \right) = 49 + v \pm \sqrt{49}$$

$$\text{جوابی } S: \begin{cases} \frac{-b}{ra} = \frac{r}{rk} = \frac{r}{k} \\ \frac{-\Delta}{ra} = \frac{-49 + 4k(-4)}{rk} = \frac{4(-4k-4)}{rk} = \frac{-4k-4}{k} \end{cases}$$

$$y = -4x - 4$$

سوال (۹)

$$\frac{-4k-4}{k} = -4\left(\frac{r}{k}\right) - 4 \rightarrow \frac{-4k-4}{k} = \frac{-4-4k}{k}$$

$$4k+4 = 4+4k$$

$$rk = 4 \rightarrow k = 2$$

$$\text{جوابی } y = \frac{-4(2)-4}{2} = \frac{-12}{2} = -6$$

$$-mx^r + mx + 1 \neq -m - x \rightarrow -mx^r + (m+1)x + m+1 \neq 0$$

سوال (۱۰)

$$\Delta < 0 \rightarrow (m+1)^r - 4(-m)(m+1) < 0 \rightarrow m^r + 2m+1 + 4m^r + 4m < 0$$

$$5m^r + 6m+1 < 0$$

$$a+c=b \rightarrow \text{نقطه: } \begin{cases} -1 \\ -\frac{c}{a} = -\frac{1}{\omega} \end{cases}$$

$$\frac{x}{y} \begin{array}{c|cc} & -1 & -\frac{1}{\omega} \\ \hline & + & - \end{array}$$

$$\rightarrow m \text{ حدود} = (-1, -\frac{1}{\omega})$$

نقطه انتهایی صریح: صفر