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سارینا زارع

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$$x^2 - \omega x + 1 = 0$$

$$\rightarrow \frac{4\alpha + \beta^{\omega}}{\omega\beta^{\omega}} = ?$$

-1

$$\alpha + \beta = -\frac{b}{a} = \omega$$

$$\rightarrow \alpha = \omega - \beta$$

$$\alpha \cdot \beta = \frac{c}{a} = 1$$

$$\frac{4\alpha + \beta^{\omega}}{\omega\beta^{\omega}} \xrightarrow{\star} \frac{4(\omega - \beta) + \beta^{\omega}}{\omega\beta^{\omega}} = \frac{4\omega - 4\beta + \beta^{\omega}}{\omega\beta^{\omega}}$$

✓ (۲)

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$$\beta^{\omega} + \omega\beta + 1 = 0 \rightarrow \beta^{\omega} = -\omega\beta - 1 \rightarrow \beta^{\omega} = \beta(\omega\beta - 1) = \omega\beta^2 - \beta$$

←

$$\omega(\omega\beta - 1) - \beta = \omega^2\beta - \omega - \beta = \omega^3\beta - \omega$$

$$\beta^{\omega} = \beta \times \beta^{\omega} = \beta(\omega^3\beta - \omega) = \omega^3\beta^2 - \omega\beta \rightarrow \omega^3(\omega\beta - 1) - \omega\beta = \omega^4\beta - \omega^3 - \omega\beta = \omega^4\beta - \omega^3$$

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$$\beta^{\omega} = \beta \times \beta^{\omega} = \beta(\omega^4\beta - \omega^3) = \omega^4\beta^2 - \omega^3\beta \rightarrow \omega^4\omega\beta - \omega^4 = \omega^5\beta - \omega^4$$

$$\frac{4\alpha + \beta^{\omega}}{\omega\beta^{\omega}} \xrightarrow{\star} \frac{4(\omega - \beta) + (\omega^5\beta - \omega^4)}{\omega(\omega\beta - 1)} = \frac{4\omega^5\beta - \omega^4}{\omega^2\beta - \omega} = 19$$

$$x_s = \frac{x_1 + x_2}{2} = \frac{3 - 1/\omega}{2} = \frac{1/\omega}{2} = 0/\sqrt{\omega}$$

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$$S = \frac{x_1 + x_2}{2} = -\frac{b}{a}, \quad x_s = -\frac{b}{2a} \rightarrow S = 2x_s$$

$$S = 2x_0/\sqrt{\omega} = 1/\omega$$

(۲) ✓

$$x^2 + 2kx + \omega = 0 \rightarrow x_2 - x_1 = \frac{4}{3}k$$

$$a=1, b=2k, c=\omega \rightarrow \Delta = 4k^2 - 2\omega$$

(۲) ✓

$$\text{تفاضل ریشه ها} = \frac{\sqrt{\Delta}}{|a|} = \frac{4}{3}k \xrightarrow{\text{به توان ۲}} \frac{\Delta}{1} = \frac{16}{9}k^2 \rightarrow 36k^2 - 18\omega = 16k^2$$

$$20k^2 = 18\omega$$

$$k^2 = 9$$

$$\left[\frac{k^2}{2}\right] = \left[\frac{9}{2}\right] = \left[\frac{4}{\omega}\right] = 4$$

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$$A = (3, 9), B = (-5, 9), \alpha^2 + \beta^2 = 5, \text{ عرض رأس سی } = 1 \quad -14$$

$$x_s = \frac{3 + (-5)}{2} = -1 \rightarrow \text{خط تقاطع}$$

$$S = \alpha + \beta = 2x_s = 2(-1) = -2$$

$$\alpha^2 + \beta^2 = S^2 - 2P \rightarrow 5 = (-2)^2 - 2P \rightarrow 2P = -1 \rightarrow P = -\frac{1}{2}$$

$$y = a(x^2 - (-2)x + (-\frac{1}{2})) + k' \rightarrow y = a(x - x_s)^2 + y_s \rightarrow y = a(x + 1)^2 + 1$$

$$y = a(x^2 + 2x + 1) + 1 = ax^2 + 2ax + (a + 1)$$

$$P = \frac{c}{a} = \frac{a+1}{a} = -\frac{1}{2} \rightarrow 2a+2 = -a \rightarrow a = -\frac{2}{3}$$

$$c = a + 1 = -\frac{2}{3} + 1 = \frac{1}{3}$$

$$-x^2 + 5x + m = 0 \rightarrow \Delta = 5^2 - 4m \geq 0 \rightarrow 25 - 4m \geq 0 \rightarrow 4m \leq 25 \rightarrow m \leq \frac{25}{4}$$

$$\Delta \geq 0 \rightarrow 25 - 4m \geq 0 \rightarrow 4m \leq 25 \rightarrow m \leq \frac{25}{4}$$

$$x_s = \frac{-b}{2a} = \frac{-5}{2(-1)} = \frac{5}{2} \Rightarrow \frac{6}{5} > \frac{5}{2} \rightarrow \text{همواره برقرار}$$

$$f(\frac{6}{5}) \leq 0 \rightarrow -(\frac{6}{5})^2 + 5(\frac{6}{5}) + m \leq 0 \rightarrow \frac{2}{5} + m \leq 0 \rightarrow m \leq -\frac{2}{5}$$

$$\left. \begin{array}{l} m \geq -\frac{9}{25} \\ m < -\frac{2}{25} \end{array} \right\} -\frac{9}{25} < m < -\frac{2}{25} \rightarrow \text{مقادیر صحیح برای } m$$

$$-6, -5, -4, -3$$

(2) ✓

۱۴ عدد

$$y = mx^2 - 12x + 2m - 1 \quad \left| \begin{array}{l} \text{ext} \\ \frac{-b}{2a} \\ \frac{-\Delta}{2a} \end{array} \right| \quad y$$

$m > 0 \rightarrow$ تابع دارای min است و به بالا می‌رود

$$y_{\min} = \frac{-\Delta}{2a} = 2 \rightarrow \frac{4ac - b^2}{4a} = \frac{4(m(2m-1)) - 144}{4m} = 2$$

$$\hookrightarrow \frac{2m^2 - m - 36}{m} = 2 \rightarrow 2m^2 - 3m - 36 = 0 \rightarrow m = \frac{3 \pm \sqrt{9 - 4(2)(-36)}}{4}$$

$$\hookrightarrow = \frac{3 \pm 27}{4} \rightarrow m = 4 \quad \text{قبول} \quad \checkmark$$

$$m = -\frac{12}{2} < 0 \quad \text{غیر قبول} \quad \times$$

$$\xrightarrow{m=4} y = 4x^2 - 12x + 14$$

$$\text{مختصات: } x = \frac{-b}{2a} = \frac{12}{2 \times 4} = 2 \rightarrow \boxed{x=2}$$

$$x^2 + 2(a+1)x + 2a - 1 = 0 \rightarrow a^2 = \alpha \cdot \beta = p \quad -15$$

$$p = \frac{c}{a} = \frac{2a-1}{1} = 2a-1 \Rightarrow a^2 = 2a-1 \rightarrow a^2 - 2a + 1 = 0$$

$$\rightarrow (a-1)^2 = 0 \rightarrow \boxed{a=1}$$

$$a=1 \text{ بررسی شود وجود داشته باشد برای } a \rightarrow x^2 + 2(1+1)x + 2(1) - 1 = 0 \rightarrow x^2 + 4x + 1 = 0$$

$$\Delta = b^2 - 4ac = 16 - 4 = 12$$

$$\boxed{a=1} \quad \text{قبول} \quad \checkmark$$

$$x^2 - vx^2 - \omega = 0$$

$$\hookrightarrow x^2 = t \rightarrow t^2 - vt - \omega = 0$$

$$\hookrightarrow p = \frac{c}{a} = -\omega \rightarrow x_1 \cdot x_2 = \sqrt{t_1} \times -\sqrt{t_1} = -t_1$$

if $t < 0 \rightarrow$ ریشه حقیقی ندارد

if $t > 0 \rightarrow$ دو ریشه حقیقی
قرینه ها

$$\left. \begin{array}{l} x_1 = \sqrt{t_1} \\ x_2 = -\sqrt{t_1} \end{array} \right\} S = x_1 + x_2 = \sqrt{t_1} + (-\sqrt{t_1}) = 0$$

$$\Delta = \frac{v \pm \sqrt{49}}{2} \xrightarrow{\text{ریشه مثبت}} \frac{v + \sqrt{49}}{2} \rightarrow p = -\frac{v + \sqrt{49}}{2}$$

$$2p^2 - 3(0)p + 2(0) = 2p^2 \rightarrow 2(vt_1 + \omega) = 1^2 t_1 + 10$$

$$p^2 = t_1^2 \rightarrow t_1^2 - vt_1 - \omega = 0 \rightarrow t_1^2 = vt_1 + \omega \rightarrow \omega 9 + v\sqrt{49}$$

$$y = kx^2 - 4x - 9 \xrightarrow{\text{اس/اس}} y = -4x - 4 - 9$$

$$\text{ext} \left| \begin{array}{l} -\frac{b}{a} \\ \frac{-\Delta}{|a|} \end{array} \right| \rightarrow \frac{4}{2k} = \frac{v}{k} \rightarrow y = k \times \frac{4}{k^2} - 4 \times \frac{v}{k} - 9 = \frac{4}{k} - \frac{4v}{k} - 9$$

$$y = -4x - 4 \rightarrow \frac{-2(2+3k)}{k} = -4\left(\frac{v}{k}\right) - 4 \rightarrow \frac{2+3k}{k} = \frac{4}{k} + 2$$

$$|k \neq 0, 2+3k = 4+2k \rightarrow k = 2$$

$$y = \frac{-4-12}{2} = -8 \rightarrow \text{جواب}$$

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$$y = -mx^2 + mx + 1 = -m - x$$

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

$$a = -m, b = m+1, c = m+1$$

$$\Delta = b^2 - 4ac \Rightarrow (m+1)^2 - 4(-m)(m+1) < 0 \rightarrow (m+1)^2 + 4m(m+1) < 0$$

$$\hookrightarrow (m+1)(2m+1) < 0 \rightarrow \text{تعیین علامت} \quad \frac{-1}{+1} \quad \frac{-1}{-1+} \rightarrow -1 < m < \frac{1}{2}$$

همه عدد صحیح در محدوده $-1 < m < \frac{1}{2}$ وجود ندارد.

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