

$$y = a(n-9)^2 - 1 \quad 1 = a(2-9)^2 - 1 \quad 1 = 49a - 1$$

$$2 = 49a \quad a = \frac{1}{18} \quad y = \frac{1}{18}(n-9)^2 - 1$$

$$y = \frac{1}{18}n^2 - n + \frac{17}{9}$$

(جواب پانزدهم)

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$$\Delta = b^2 - 4ac > 0 \quad \frac{-b}{a} > 0 \quad \frac{c}{a} > 0 \quad \Delta = m^2 - 4(2)(m+4)$$

$$m^2 - 8m - 8 > 0 \quad m^2 - 8m - 8 = 0 \rightarrow m = 12, m = -4$$

$$m < -4 \quad \text{و} \quad m > 12 \quad \frac{-m}{9} > 0 \Rightarrow m < 0 \quad \frac{m+8}{9} > 0 \Rightarrow m+8 > 0 \Rightarrow m > -8$$

$$\Rightarrow -8 < m < -4 \rightarrow (-8, -4) \checkmark$$

۲

$$s = -\frac{2m-1}{3} \quad p = -\frac{2-m}{3} \quad s = \frac{1}{p} \quad -\frac{2m-1}{3} = \frac{3}{2-m}$$

$$-(2m-1)(2-m) = 9 \quad 2m^2 - 8m + 2 = 9 \quad \Delta = 11 \quad m = \frac{4 \pm \sqrt{11}}{2} \quad m = -1$$

$$(2m-1)^2 - 12(2-m) \geq 0 \quad 2m^2 - 8m - 2 = 0 \quad m = \frac{4 \pm \sqrt{10}}{2} \checkmark$$

۳

$$x^2 - x - 4 = 0 \quad x_1 + x_2 = 1 \checkmark \quad x_1 x_2 = -4 \checkmark \quad x_1^3 + x_2^3 = 13$$

$$\frac{1}{x_1^3} + \frac{1}{x_2^3} = \frac{x_2^3 + x_1^3}{(x_1 x_2)^3} = \frac{13}{(-4)^3} = -\frac{13}{64} \quad s = 13 - \frac{13}{64} = \frac{819}{64}$$

$$p = -\frac{819}{64} \quad x^2 - s + p = 0 \quad x^2 - \frac{819}{64} - \frac{819}{64} = 0 \quad 64x^2 - 1638 + 1638 = 0$$

۴

$$\left(\sqrt[3]{2^r} + \frac{1}{\sqrt[3]{2^r}} + 1\right)(\sqrt[3]{2^r} - 1) = \sqrt[3]{2^r} \rightarrow \frac{(\sqrt[3]{2^r} + \sqrt[3]{2^r} + 1)(\sqrt[3]{2^r} - 1)}{\sqrt[3]{2^r}} = \sqrt[3]{2^r}$$

$$\rightarrow 2^r - 1 = 2^r \rightarrow 2^r - 2^r - 1 = 0 \rightarrow 2^r + 2^r - \frac{b}{a} = 2$$

۵

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$$3n^2 - an + 4 = 0 \quad n_1 = 3n_2 \quad 3n^2 - an + 4 = 0 \quad n_1 + n_2 = \frac{a}{3}$$

$$n_1 \times n_2 = \frac{4}{3} \quad n_1 + n_2 = 3n_2 + n_2 = 4n_2 = \frac{a}{3} \Rightarrow a = 12n_2$$

$$n_1 n_2 = 3n_2 \times n_2 = 3n_2^2 = \frac{4}{3} \Rightarrow n_2^2 = \frac{4}{9} \Rightarrow n_2 = \pm \frac{2}{3} \quad a = 12n_2$$

$$\Rightarrow a = 12 \times \frac{2}{3} = 8 \quad a = 12n_2 \Rightarrow a = 12 \times \left(-\frac{2}{3}\right) = -8 \quad |8 - (-8)| = 16$$

$$y = an^2 + (3+2a)n = n(an + (3+2a)) = 0 \rightarrow n=0, an + (3+2a) = 0$$

$$\Rightarrow n = -\frac{3+2a}{a} \quad (a \neq 0) \quad n = -\frac{3+2a}{a} \quad n=0 \rightarrow$$

جواب پائین سمت

$$n_r = -\frac{b}{2a} = -\frac{3+2a}{2a} \quad -\frac{3+2a}{2a} \geq 0 \Rightarrow 3+2a \leq 0 \Rightarrow a \leq -\frac{3}{2}$$

$$-\frac{3+2a}{a} \geq 0 \Rightarrow 3+2a \geq 0 \Rightarrow a \geq -\frac{3}{2} \quad \text{یا } a > 0 \quad x \leftarrow$$

$$a=0 \rightarrow y=3n \rightarrow -\frac{3}{2} \leq a < 0, a=0 \vee a \in \left[-\frac{3}{2}, 0\right]$$

مثلاً: $a=1, b=4 \Rightarrow n_1 = -\frac{a}{3} = -\frac{1}{3}$ مثلاً: $a=-1, b=-2 \Rightarrow n_1 = -\frac{-1}{-1-2} = -\frac{1}{-3} = \frac{1}{3}$

جواب پائین سمت

$$1 - \frac{1}{3} = \frac{2}{3} \quad -\frac{1}{3} = 1 \Rightarrow a = -2 \quad 1 - n_1 - 2n_2 = 0 \Rightarrow n_1 - 2n_2 = 0 \Rightarrow$$

$$n = 2, n = -1 \quad \text{مثلاً: } 1 - n_1 - 2n_2 = 0 \Rightarrow -n_1 - 2n_2 = -1 \Rightarrow n_1 + 2n_2 = 1$$

$$a=-2 \rightarrow a=1, b=14 \quad ab=1 \times 14 = 14$$

$$3n^2 - an - 4 = n^2 - an + b \quad 3n^2 - an - 4 = n^2 + an - b = 0 \Rightarrow n^2 - (b+4) = 0$$

$$n^2 = b+4 \rightarrow n = \pm \sqrt{b+4} \quad \sqrt{b+4} - (-\sqrt{b+4}) = 2\sqrt{b+4} = \frac{1}{3} \Rightarrow$$

$$b+4 = \frac{1}{36} \Rightarrow b = -\frac{95}{36} \quad a=2 \quad b = -\frac{95}{36} \quad \frac{ab}{3} = \frac{2 \times -\frac{95}{36}}{3} = -\frac{95}{54}$$

جواب پائین سمت

$$r^2 + 4r + m = 0 \Rightarrow m = -r^2 - 4r \quad r^2 + 4r - 3m = 0 \Rightarrow 3m = r^2 + 4r \Rightarrow$$

$$m = \frac{r^2 + 4r}{3} \quad -r^2 - 4r = \frac{r^2 + 4r}{3} \Rightarrow 3(-r^2 - 4r) = r^2 + 4r \Rightarrow$$

$$-3r^2 - 12r = r^2 + 4r \quad -4r^2 - 16r = 0 \Rightarrow r(-4r - 16) = 0 \quad r = 0 \quad -4r - 16 = 0$$

$$r = -4 \quad m = -r^2 - 4r = -16 + 16 = 0 \quad n^2 + 4m = 0 \rightarrow (n+4)(n+0) = 0$$

$$n^2 + 4m - 16 = 0 \rightarrow (n-4)(n+8) = 0 \rightarrow n=4, n=-8$$

$$3 - (-1) = 4$$

سوال ۱۱

$$y = ax^r + bx + c \xrightarrow{C=1} x = \frac{-b}{\frac{1}{10}} = -1 \rightarrow b = 10$$

$$\begin{cases} (-1, 9) \rightarrow a - b + c = 9 \xrightarrow{b=10} a - 10 + c = 9 \rightarrow -a + c = 9 \\ (1, 1) \rightarrow 9a + 10b + c = 1 \xrightarrow{b=10} 9a + 100 + c = 1 \rightarrow 9a + c = -99 \end{cases} \rightarrow \begin{cases} a = -\frac{1}{9} \\ c = \frac{10}{9} \\ b = -1 \end{cases}$$

$$y = -\frac{1}{9}x^9 - x + \frac{10}{9}$$

معادله شعری ←

$$x^r - x - 1 = 0 \rightarrow S = 1, P = -1$$

$$x^r - Sx + P = 0 \xrightarrow{\text{wavy line}} x^r - \frac{\Delta 1}{F}x - \frac{111}{F} = 0 \rightarrow 10x^r - \Delta 10x - 111 = 0$$

سوال ۴

$$S = \alpha + \beta = x_1^r + x_2^r + \frac{1}{x_1} + \frac{1}{x_2} = (x_1 + x_2)(x_1^r + x_2^r - x_1 x_2) + \frac{x_1 x_2 + 1}{x_1 x_2}$$

$$\rightarrow (S)(S^r - P - P) + \frac{S}{P} = 11 - \frac{1}{F} = \frac{\Delta 1}{F}$$

$$P = \alpha\beta = (x_1^r + \frac{1}{x_1})(x_2^r + \frac{1}{x_2}) = x_1^r x_2^r + x_1^r + x_2^r + \frac{1}{x_1 x_2} = (P)^r + S^r P + \frac{1}{P} = -\Delta\Delta - \frac{1}{F} = -\frac{111}{F}$$

(I) $\rightarrow$ از این معادله می توانیم $a > 0$ را بدست آوریم

سوال ۱۰

$$S > 0 \rightarrow -\frac{r+10}{a} > 0 \rightarrow \frac{r+10}{a} < 0 \rightarrow \frac{-\frac{r}{F}}{+1-1+} \quad -\frac{r}{F} < 0 < \quad (II)$$

$$(I) \cap (II) = \emptyset \rightarrow a \text{ صحیح نیست}$$

$$\begin{cases} y = x^r + ax - r \rightarrow a = \frac{-b}{\frac{1}{10}} \rightarrow a = -\frac{a}{r} \\ y = -x^r - 10a + b \rightarrow a = \frac{-b}{\frac{1}{10}} \rightarrow a = \frac{-r}{-r} = -1 \end{cases} \rightarrow \frac{-a}{r} = -1 \rightarrow a = r$$

سوال ۱۱

$$\begin{cases} y = x^r + 10x - r \\ y = 1 \end{cases} \rightarrow x^r + 10x - r = 0 \rightarrow (a+r)(a-1) = 0$$

$$ab = 1$$

$$\begin{cases} a = 1 \rightarrow A(1, 1) \rightarrow 1 = -4 + 9 + b \rightarrow b = 4 \\ a = -1 \rightarrow B(-1, 1) \end{cases}$$

سوال ۹

$$S = \alpha + \beta = -\frac{1}{r}, P = \alpha\beta = -\frac{r}{a}$$

$$S = (\alpha + \gamma\Delta) + (\beta + \gamma\Delta) = \frac{a}{r} \rightarrow \alpha + \beta + 1 = \frac{a}{r} \rightarrow -\frac{1}{r} + 1 = \frac{a}{r} \rightarrow a = 1$$

$$P = (\alpha + \gamma\Delta)(\beta + \gamma\Delta) = \alpha\beta + \gamma\Delta(\alpha + \beta) + \gamma^2\Delta^2 = \frac{b}{r}$$

$$\rightarrow -\frac{r}{a} + \gamma\Delta(-\frac{1}{r}) + \gamma^2\Delta^2 = \frac{b}{r} \rightarrow b = -4$$

$$\left[\frac{ab}{r}\right] = \left[\frac{1 \times -4}{r}\right] = -1$$