

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۳۰ کلاس: (۳)

۱۷,۵

$$f(n) - n + 1 \geq 0 \rightarrow f(n) - n \geq -1$$

$$[n] > 8 \rightarrow n > 8 \rightarrow f(n) - n = n - 1 \geq 8 \rightarrow n - 1 \geq 8 \rightarrow n \geq 9 \checkmark$$

$$[n] \leq 8 \rightarrow n < 9 \rightarrow f(n) + 3 - n = f(n) + 3 < 18 \rightarrow f(n) + 3 \geq -1$$

$$n \geq 9 \rightarrow f(n) - n \geq -1$$

$$\rightarrow n \geq \frac{-4}{3} \checkmark$$

$$n < 9 \rightarrow f(n) - n < 18, \quad n \geq \frac{-4}{3} \rightarrow f(n) - n \geq -1$$

$$D: \left[-\frac{4}{3}, 9\right) \cup [9, +\infty) = \left[-\frac{4}{3}, +\infty\right) \checkmark$$

$$f(n) = 3(1n^2 + 12n^2 + 4n + 1) = 3(13n^2 + 4n + 1)$$

$$f(n) = 3(13n^2 + 4n + 1) \rightarrow 13n^2 + 4n + 1 \Rightarrow f(n) = \frac{-4}{13} \Rightarrow (n + \frac{2}{13})^2 = n^2 + n + \frac{4}{169}$$

$$x \geq \frac{4}{169} \rightarrow 13n^2 + 4n + 1 \Rightarrow f(n) = (13n^2 + 4n + 1) \Rightarrow f(n) = \frac{3(13n^2 + 4n + 1)}{(13n^2 + 4n + 1)} = \frac{3}{1}$$

$$R = \mathbb{R} - \left\{ \frac{-4}{13} \right\} = \mathbb{R} - \left\{ -\frac{4}{13} \right\}$$

$$\frac{a}{b+1} \rightarrow g(n) = 1 + C = f(n) = \frac{a+2}{b+1}$$

$$b + C = \frac{1}{p} + 2 = \frac{2p+1}{p}$$

$$\frac{a}{b-1} \rightarrow g(n) = C - 1 = f(n) = \frac{a-2}{b-1}$$

$$\frac{a}{b} \rightarrow g(n) = C = f(n) = \frac{a-2}{-1} = 2 \Rightarrow C = 2$$

$$\frac{a+2}{b+1} = 1 + 2, \quad \frac{a-2}{b-1} = 2 - 1 \Rightarrow \frac{a+2}{b+1} = 3, \quad \frac{a-2}{b-1} = 1 \Rightarrow \frac{a+2}{b+1} = 3 \Rightarrow \frac{a-2}{b-1} = 1 \Rightarrow \frac{a+2}{b+1} = 3 \Rightarrow \frac{a-2}{b-1} = 1 \Rightarrow b = \frac{2}{3}$$

$$f(n) = g(n) \rightarrow \frac{(n+1)}{n-1} = \frac{(n+1)(n-1)}{n^2 + an + b} \rightarrow n^2 + an + b = (n-1)(n-1)$$

$$n^2 + an + b = (n-1)(n-1) \Rightarrow a = (-1) + (-1) = -2 \checkmark, \quad b = (-1)(-1) = 1 \checkmark$$

$$1 \rightarrow (1)^2 + (1)a + b = 1 + a + b = 0 \rightarrow a + b = -1 \checkmark$$

$$C \rightarrow \frac{b}{a} = \frac{1}{-2} \rightarrow \frac{b}{a} = -\frac{1}{2} \Rightarrow a = -2b$$

$$\frac{b}{a} = C, \quad b = C \rightarrow a = 1 / \frac{1}{-2}, \quad a + b = -1 \rightarrow \frac{1}{-2} + C = -1 \rightarrow C = -\frac{1}{2}$$

$$f(n) = (n-2)^2 (n-1)$$

$$f(n+1) = ((n+1)-2)^2 ((n+1)-1) = (n-1)^2 (n) \checkmark$$

$$f(1-n) = ((1-n)-2)^2 ((1-n)-1) = (-n-1)^2 (-n) = (-1)(n+1)^2 (-n) = (n+1)^2 (-1)(n) \checkmark$$

$$g(n) = (n-2)^2 (n) + ((-1)(n+1))^2 (-1)(n) = (n) \left((n-2)^2 + (n+1)^2 (-1) \right)$$

$$g(n) = n(n^2 - 4n + 4 - n^2 - 2n - 1) = n(-5n + 3) = -5n^2 + 3n$$

انتخاب درستی !!

$$f(-1) = 1 - 2n = -1 \rightarrow n = 1 \quad 1 > 0 \rightarrow \sqrt[3]{1} = 1 \quad f(-1) + f(1) = 1 + 1 = 2$$

$$f(1) = 1 - 2n = 1 \rightarrow n = -1 \quad -1 < 0 \rightarrow \sqrt[3]{-1 + 1} = 1$$

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$$n + \sqrt{n} = 4 \rightarrow n + \sqrt{n} - 4 = 0$$

$$(\sqrt{n} + 1)(\sqrt{n} - 3) = 0 \quad \begin{cases} \sqrt{n} = -3 & \text{ÖÖ} \\ \sqrt{n} = 3 & \checkmark \rightarrow n = 9 \end{cases}$$

$$f(4) = (1)^4 + 3(2) = 104 + 12 = 116$$

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$$n-1 = t \rightarrow f(t) = t^n + t$$

$$1-n = -t \rightarrow f(-t) = (-t)^n + (-t) = -t^n - t$$

$$f(t) + f(-t) = t^n + t - t^n - t = 0$$

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$$f-g = \{(1, k)\} \quad f(m) - g(m) \stackrel{m=1}{=} k$$

$$D_f: m - 2a \geq 0 \rightarrow m \geq \frac{1}{2}a$$

$$D_g: b - 2m \geq 0 \rightarrow m \leq \frac{1}{2}b$$

$$n=1 \Rightarrow \frac{1}{2}a = \frac{1}{2}b = 1 \Rightarrow \begin{cases} a = 2 \\ b = 2 \end{cases}$$

$$\sqrt[3]{\cancel{1} - \cancel{2}a} + 2k - 2 - \sqrt[3]{\cancel{b} - \cancel{2} - \cancel{2}k} = k$$

$$2k - 2 - 2k = k$$

$$2k = 2 \quad k = 1$$

$$2a - \frac{b}{2} + k = 2 - 1 + 1 = 2$$

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$$f(m) = \sqrt{m-n} + n \xrightarrow{Df} m \geq n$$

$$g(m) = \sqrt{2m+1} \xrightarrow{Dg} m \geq -1$$

$$D_{f \circ g} = [-1, 4] \Rightarrow m = 1$$

$$n=1 \rightarrow \sqrt{1-1} + 1 = 1+1 = 2$$

$$m=1 \rightarrow \sqrt{2(1)+1} = \sqrt{3} = \sqrt{3}$$

$$2+1 = \sqrt{3} = \sqrt{3} \Rightarrow n = \sqrt{3} - 1$$

$$m+n = 1 + \sqrt{3} - 1 = \sqrt{3}$$

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$$y = \frac{3(12n^2 + 12n + 4n + 1)}{(2n+1)^4} = \frac{3(2n+1)^3}{(2n+1)^4} = \frac{3}{2n+1}$$

$$\Rightarrow Dy = \mathbb{R} - \left\{ -\frac{1}{2} \right\}$$

$$D_f = \mathbb{R} - \{C\}$$

۴- چون دو تابع با هم برابرند دامنه‌های برابر داشته‌اند:

یعنی g را در مخزن ریشه ضاعف داشته:

$$n^2 + an + b = (n - C)^2 = n^2 - 2Cn + C^2 \rightarrow \begin{cases} a = -2C \\ b = C^2 \end{cases}$$

$$g(n) = f(n) \rightarrow$$

همچنین ضابطه‌ها یکسان دارند:

$$\frac{n^2 - 1}{n^2 + an + b} = \frac{n+1}{n-C} \rightarrow \frac{(n-1)(\cancel{n+1})}{(n-C)^2} = \frac{\cancel{n+1}}{\cancel{n-C}} \rightarrow \begin{cases} C = 1 \\ a = -2 \\ b = 1 \end{cases} \quad \left. \begin{array}{l} \text{جواب: } \boxed{5} \end{array} \right\}$$

$$f(1-n) = (1-n-3)^2(1-n-1) = -n(n+2)^2$$

$$f(n+1) = (n+1-3)^2(n+1-1) = n(n-2)^2 \quad \text{مزدوج}$$

$$\begin{aligned} g(n) &= n(n-2)^2 - n(n+2)^2 = n((n-2)^2 - (n+2)^2) = \\ &= n(n-2-n-2)(n-2+n+2) = n(-4n) = -4n^2 \end{aligned}$$

در واقع

$$f(1-n) = -n(n-2)^2 = -n(n+2)^2 \quad \text{چون توان ۲ دارد و علامت رو برگشته}$$