

۲۰ آفرین

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

$$f(n) \rightarrow 2n-1; n \geq 0 \rightarrow f(n) + 1 \geq n \xrightarrow{n \geq 0} 2n-1+1-n \geq 0 \rightarrow n \geq 0 \Rightarrow n \geq 0$$

$$\rightarrow f(n) + 3; n < 0$$

$$\textcircled{1} \rightarrow -\frac{3}{2} \leq n < 0 \quad Dg = I \cup II = -\frac{3}{2} \leq n \quad \left[-\frac{3}{2}, +\infty \right)$$

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

$$Dg = IR - \left\{ -\frac{1}{2} \right\}$$

$$f(n) = \begin{cases} \frac{n^2 + 2n^2 - n - 2}{(n-1)(n+1)} = \frac{(n-1)(n^2 + 2n + 2)}{(n-1)(n+1)} = \frac{(n-1)(n+2)(n+1)}{(n-1)(n+1)} = n+2 \end{cases}$$

$$g(n) = n + c \xrightarrow{\frac{a+n}{x+b}} \begin{cases} n=1 \rightarrow \frac{a+1}{1+b} = 2 \rightarrow a+1 = 2+2b \rightarrow a = 2b+1 \\ n=-1 \rightarrow \frac{-a+1}{b-1} = 1 \rightarrow -a+1 = b-1 \rightarrow a+b = 2 \end{cases}$$

$$\rightarrow n+c = n+2 \Rightarrow c=2 \Rightarrow \begin{cases} n=1 \rightarrow y=2 \\ n=-1 \rightarrow y=1 \end{cases} \rightarrow \begin{cases} a=2b+1 \\ a+b=2 \end{cases} \rightarrow \begin{cases} b=1 \\ a=1 \end{cases}$$

$$\left. \begin{aligned} f(n) &= \frac{n+1}{n-c} \\ g(n) &= \frac{(n-1)(n+1)}{n^2 + an + b} \end{aligned} \right\} \rightarrow n^2 + an + b = (n-c)(n-1) \xrightarrow{Dg=Df} (n-1) = (n-c)$$

$$\Rightarrow n^2 + an + b = (n-1)^2 = n^2 - 2n + 1$$

$$\rightarrow \begin{cases} a = -2 \\ b = 1 \\ c = 1 \end{cases} \rightarrow a+b+c = (-2)+1+1 = 0$$

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

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

$$n^3 - 4n^2 + 8n - n^3 - 4n^2 - 8n = -8n^2$$

$$1-2n=3 \rightarrow n=-1 \rightarrow \sqrt[n]{n}+2 = 1 \quad \left. \begin{array}{l} 1-2n=-1 \rightarrow n=1 \rightarrow \sqrt[n]{n}=1 \end{array} \right\} \rightarrow f(-1)+f(3)=1+4=5$$

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$$n+\sqrt{n}=4 \rightarrow n-4=\sqrt{n} \xrightarrow{\text{توان}} n^2-12n+16=n \rightarrow n^2-13n+16=0$$

$$(n-2)(n-8)=0 \rightarrow n \in \{2, 8\}$$

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$$f(4+\sqrt{4})=f(4)=(4)^4+3(4)=244$$

$$f(n-1)+f(1-n)=(n-1)^3+(n-1)+(1-n)^3+(1-n)=0$$

قرینه هم بنابرین حذف می شوند

قرینه اند بنابرین جمع آنها صفر می شود.

$$f(x)=\sqrt{x-3a}+k-1 \rightarrow D_f=\left[\frac{3a}{2}, +\infty\right) \quad D_f \cap D_g = 1 \rightarrow \frac{3a}{2} = +\frac{b}{2}$$

$$g(x)=\sqrt{b-3x}+3k \rightarrow D_g=(-\infty, +\frac{b}{3}] \quad \boxed{3a=b}$$

$$f-g=(1, k) \rightarrow 2\left(\sqrt{1-b}+k-1\right)-\left(\sqrt{b-1}+3k\right)=2\sqrt{1-b}+2k-2-\sqrt{b-1}-3k=k$$

$$\rightarrow 2k=-2 \rightarrow k=-1$$

$$3a=b \rightarrow a=\frac{b}{3}$$

$$3a-\frac{b}{3}-k=3\left(\frac{b}{3}\right)-\frac{b}{3}-(-1)=\frac{2b}{3}+1$$

$$f(x)=\sqrt{m-x}+n \rightarrow D_f=(-\infty, m] \quad D_f \cap D_g = [-1, m] = [-1, 1] \rightarrow m=1$$

$$g(x)=\sqrt{2x+1} \rightarrow D_g=[-1, +\infty)$$

$$f(1)=\sqrt{1-(1)}+n=0+n=n$$

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

$$f-g=1+n-\frac{2\sqrt{3}}{\sqrt{1}}=4\sqrt{3} \rightarrow n=4\sqrt{3}-1$$

$$m+n=1+4\sqrt{3}-1=4\sqrt{3}$$

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