

$$f(n) - n > -1 \Rightarrow f(n) > n-1$$

$$f(n) = \begin{cases} 2n-1 & n > 0 \\ 2n+1 & n < 0 \end{cases}$$

$$\left. \begin{aligned} 2n-1 > n-1 &\Rightarrow n > 0 \quad \checkmark \\ 2n+1 > n-1 &\Rightarrow 2n > -2 \Rightarrow n > -1 \end{aligned} \right\}$$

$$\Rightarrow D_f = \left[-\frac{1}{2}, +\infty\right)$$

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$$f = \frac{2[1n^2 + 12n^2 + 9n + 1]}{(2n+1)^2} = \frac{2[1n^2 + 1 + 9n + 12n^2]}{(2n+1)^2} = \frac{2[(2n+1)(2n^2 + 2n + 1) + 9n(2n+1)]}{(2n+1)^2}$$

$$= \frac{2(2n+1)(2n^2 + 11n + 1)}{(2n+1)^2} = \frac{2(2n^2 + 11n + 1)}{(2n+1)^2} \Rightarrow 2n+1 \neq 0 \Rightarrow n \neq -\frac{1}{2}$$

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

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$$f(n) = \begin{cases} \frac{(n-1)(n^2+2n+2)}{(n-1)(n+1)} = \frac{(n-1)(n+1)(n+2)}{(n-1)(n+1)} = n+2 & ; n \neq \pm 1 \\ \frac{an+r}{n+b} & ; n = \pm 1 \end{cases}$$

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$$\Rightarrow c = 1$$

$$\sim n=1 \Rightarrow \frac{a+r}{b+1} = r \Rightarrow a+r = rb+r \Rightarrow a-cb = 1$$

$$n=-1 \Rightarrow \frac{r-a}{b-1} = 1 \Rightarrow r-a = b-1 \Rightarrow a+b = r$$

$$\Rightarrow \begin{cases} b = 1/r \\ a = r/a \end{cases}$$

$$c = 1$$

$$n^2 + an + b = (n-1)^2 = n^2 - 2n + 1 \Rightarrow \begin{cases} a = -2 \\ b = 1 \end{cases} \Rightarrow a+b+c = -2+1+1 = 0$$

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$$\left. \begin{aligned} f(n+1) &= (n-2)^2(n) \\ f(1-n) &= (n+2)^2(-n) \end{aligned} \right\} \Rightarrow g(n) = (n-2)^2(n) - (n+2)^2(n) = n((n-2)^2 - (n+2)^2)$$

$$= -12n$$

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$$1-2n = -1 \Rightarrow n = 1 \Rightarrow f(-1) = 1$$

$$1-2n = 3 \Rightarrow n = -1 \Rightarrow f(3) = 1 \Rightarrow f(-1) + f(3) = 1+1 = 2$$

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$$n + \sqrt{n} = 5 \Rightarrow n = 4 \Rightarrow f(4) = (4)^2 + 2(4) = 24$$

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

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

$$\Rightarrow f(n-1) + f(1-n) = 0$$

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$$\begin{aligned} \Rightarrow b-r &= 0 \Rightarrow b=r \\ r-ra &= 0 \Rightarrow ra=r \\ \Rightarrow 2f-g &= 2k-2-2k=k \Rightarrow k=-1 \end{aligned}$$

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$$① (r+n)(m-n) \geq 0 \Rightarrow \frac{-1}{-} \mid + \mid \frac{m}{-} \quad \text{D.f.} = [-1, r] \Rightarrow m = r$$

$$② \xrightarrow{n=r} r+n-r\sqrt{r}=4\sqrt{r} \Rightarrow n = 4\sqrt{r} - r \Rightarrow n+m = 4\sqrt{r} + r$$

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