

$$\sqrt{n f(n)} \rightarrow n f(n) \geq 0$$

$$\begin{array}{ccccccc} - & a & & 0 & & & + & a \\ - & | & + & | & - & | & + & | \\ - & | & + & | & - & | & + & | \end{array}$$

$$[2, a] \cup [-a, -]$$

$$\frac{-n}{f(n)} \geq 0 \quad f(n) \neq 0$$

$$\begin{array}{ccccccc} - & 2 & & 0 & & & + & a \\ - & | & + & | & - & | & + & | \\ - & | & + & | & - & | & + & | \end{array}$$

$$(-\infty, 0) \cup (0, 2)$$

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

$$f(2) \Rightarrow f(2) - 2f(2) = 2 - 4 + 2 \rightarrow -f(2) = 2 \rightarrow f(2) = -2$$

$$f(-2) \Rightarrow f(-2) - (-2) = 2 + 4 + 2$$

$$f(-2) + 2 = 12$$

$$f(-2) = 10$$

$$f(a) \rightarrow n - \sqrt{n+2} \rightarrow a - \sqrt{a+2} = a - 2 = 2$$

$$f(1) \rightarrow 2n + 2 \rightarrow 2 + 2 = 4$$

$$f(2) \rightarrow 2n + 2 \rightarrow 4 + 2 = 6$$

$$\underbrace{f(f(a))}_2 + \underbrace{f(f(1))}_4 = 2 + 4 = 6$$

$$f(n-1) = a(n-1)^2 - b(n-1) + 2 \rightarrow a(n^2-1) - b(n-1) + 2 \rightarrow an^2 + a - 2an - b(n-1) + 2$$

$$f(n-1) - f(n) = 4n + 2 \rightarrow an^2 + a - 2an - b(n-1) + 2 - (an^2 + a - 2an - b(n-1) + 2) = 4n + 2 \rightarrow a - 2a + b = 4n + 2$$

$$n=0 \rightarrow a - 0 + b = 0 + 2 \rightarrow a + b = 2$$

$$n \rightarrow a - 2a + b = 4 + 2 \rightarrow -a + b = 6$$

$$\left. \begin{array}{l} a + b = 2 \\ -a + b = 6 \end{array} \right\} + \Rightarrow \begin{array}{l} 2b = 8 \rightarrow b = 4 \\ a = -2 \end{array}$$

$$a - b \rightarrow -2 - 4 = -6$$

$$\frac{xf(x) + f(-1)}{f'(x)} = \frac{(x \times 1) + 1}{1} = \frac{x+1}{1} = x$$

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$$f(x) = x - x + 1 = 1$$

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

$$f'(x) = x - x + 1 = 1$$

$$\frac{xf(x) - xf(-x)}{f'(x)} = \frac{(1 \times x) - (x \times 1)}{1} = \frac{x - x}{1} = \frac{0}{1} = 0$$

$$f(x) = x^2 + 1 \rightarrow (x^2 \times x) + 1 = x^3$$

$$f(-x) = x^2 \rightarrow (-x)^2 = x^2$$

$$f'(x) = 2x \rightarrow (x \times x) + 1 = x^2$$

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$$\frac{f\left(\frac{1}{f(x)}\right) - f\left(f\left(\frac{1}{x}\right)\right)}{f(1) - 1} = \frac{0}{2} = 0$$

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$$\frac{f(\sqrt{x}-1) \rightarrow (\sqrt{x}-1)^2 + 2(\sqrt{x}-1) + 1}{(\sqrt{x}-1)^2 + 2(\sqrt{x}-1) + 1} = \frac{x+2-2\sqrt{x}+2\sqrt{x}-1+1}{x+2-2\sqrt{x}+2\sqrt{x}-1+1} = \frac{2}{2} = 1$$

$$f(x) = \frac{(x)^2 + (x \times x) + 1}{(x^2) + (x \times x) + 1} = \frac{x^2 + x^2 + 1}{x^2 + x^2 + 1} = \frac{2x^2 + 1}{2x^2 + 1} = 1$$

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$$f(\sqrt{n}) = (\sqrt{n})^2 + \frac{1}{(\sqrt{n})^2} \rightarrow \left(n + \frac{1}{n}\right)^2 \rightarrow n^2 + \frac{1}{n^2} + 2$$

$$n^2 + \frac{1}{n^2} + 2 - n^2 - \frac{1}{n^2} = 2$$

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