

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

$$\frac{-1}{-1} + \frac{0}{+1} - \frac{2}{-1} + \frac{1}{+1} = 0 \quad [1, 1] \cup [-1, -1]$$

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

$$\frac{-1}{-1} + \frac{0}{+1} - \frac{2}{-1} + \frac{1}{+1} = 0 \quad (-1, 0) \cup (0, 1)$$

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

$$f(1) \Rightarrow f(1) - 2f(1) = 1 - 2 + 1 \rightarrow -f(1) = 0 \rightarrow f(1) = 0$$

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

$$f(-1) + 1 = 3$$

$$f(-1) = 2$$

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

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

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

$$\underbrace{f(f(1))}_1 + \underbrace{f(f(1))}_1 = 1 + 1 = 2$$

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

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

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

$$n=1 \rightarrow a - 2a + b = 4 + 2 \rightarrow -a + b = 6$$

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

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

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

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

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

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

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

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

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

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

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

$$\frac{f(\sqrt{x}-1) \rightarrow (\sqrt{x}-1)^2 + x(\sqrt{x}-1) + 9}{(\sqrt{x}-1)^2 + x(\sqrt{x}-1) + 4} = \frac{x+1-x\sqrt{x}+x\sqrt{x}-1+9}{x+1-x\sqrt{x}+x\sqrt{x}-1+4} = \frac{9}{4} = \frac{9}{4}$$

$$f(x) = \frac{(x)^2 + (x \times x) + 9}{(x^2) + (x \times x) + 4} = \frac{x^2 + x^2 + 9}{x^2 + x^2 + 4} = \frac{2x^2 + 9}{2x^2 + 4}$$

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

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