

$$y = \sqrt{n f(n)}$$

$$n f(n) \geq 0$$

$$D = [-4, 0] \cup [2, 2]$$

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$$y = \sqrt{\frac{-n}{f(n)}}$$

$$-4-1 \neq 1$$

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

$$(-4, 2)$$

$$f(n) - 2f(2) = n^2 - 5n + 4$$

$$f(n) - 2f(2) = 0 \Rightarrow f(2) = 0$$

$$n = -2$$

$$f(-2) = 13$$

$$f(-2) = (-2)^2 - 5(-2) + 4 = 4 + 10 + 4 = 18$$

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$$f(n) = \begin{cases} n - \sqrt{n} + 5 & n > 3 \\ 2n + 3 & n \leq 3 \end{cases}$$

$$f(1) = 2(1) + 3 = 5$$

$$f(f(1)) = f(5) = 5$$

$$5 + 4 = 9$$

$$f(5) = 5 - \sqrt{5} + 5 = 10 - \sqrt{5}$$

$$f(f(5)) = f(10 - \sqrt{5}) = 10 - \sqrt{5}$$

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$$f(n) = an^2 + bn + c$$

$$f(n-1) - f(n) = 4n + 1$$

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

$$-2a = 4 \Rightarrow a = -2$$

$$a + b = 1 \Rightarrow b = 3$$

$$a - b = -2 - 3 = -5$$

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

$$f(2) = 4 - 4 + 1 = 1$$

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

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

$$f'(2) = 1$$

$$\frac{2f(2) + f(-1)}{f'(2)} = \frac{2(1) + 3}{1} = 5$$

$$f(n) = \begin{cases} 2n+1 & n \geq 2 \\ n^2 & n < 2 \end{cases}$$

$$f(2) = 5 \quad f(-2) = 4 \quad f(2) = 2$$

$$\frac{2f(2) - 2f(-2)}{f'(2)} = \frac{2(5) - 2(4)}{2} = 1$$

$$f = \{(1, 4), (2, 1), (1, 4)\}$$

$$f(1) = 1 \Rightarrow f(f(1)) = f(1) = 1$$

$$f(2) = 2 \Rightarrow f(f(2)) = f(2) = 2$$

$$4 - 1 = 3$$

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

$$f(n) = \frac{n^2 + 2n + 9}{n^2 + 2n + 2}$$

$$n = \sqrt{2} - 2$$

$$n + 2 = \sqrt{2}$$

$$n^2 + 2n = (n+2)^2 - 2 = 2 - 2 = 0$$

$$f(\sqrt{2} - 2) = \frac{-1 + 9}{-1 + 2} = 8$$

$$f(f(\sqrt{2} - 2)) = f(8)$$

$$\frac{8^2 + 2(8) + 9}{8^2 + 2(8) + 2} = \frac{81}{74}$$

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

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

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

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