

$$y = \sqrt{x f(x)} \rightarrow x f(x) \geq 0$$

$$\begin{array}{ccccccc} & -4 & -\infty & 0 & 2 & \infty \\ & | & | & | & | & | \\ & - & - & + & - & + \end{array}$$

بر اساس جدول

$$D_f = [-\infty, 0] \cup [2, \infty]$$

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$$y = \sqrt{\frac{-x}{f(x)}} \rightarrow \frac{-x}{f(x)} \geq 0$$

$$\begin{array}{ccccccc} & -4 & -3 & 0 & 2 & \infty \\ & | & | & | & | & | \\ & - & + & + & - & - \end{array}$$

بر اساس جدول

$$D_f = [-3, 0) \cup (0, 2]$$

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

$$f(-2) \rightarrow f(-2) - 2(-2) = (-2)^2 - 3(-2) + \varepsilon$$

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

$$f(-2) = 10$$

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$$f(1) \rightarrow f(x) = 2x + 3 \rightarrow 2(1) + 3 = f(1) \rightarrow f(1) = 5$$

$$f(\infty) \rightarrow f(x) = 2x - \sqrt{x+1} \rightarrow \infty - \sqrt{\infty+1} = f(\infty) \rightarrow \infty - 3 = 2 = f(\infty)$$

$$f(f(\infty)) + f(f(1)) = f(2) + f(5) = 7 + 2 = 9$$

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$$f(2) \rightarrow f(x) = 2x + 3 \rightarrow f(2) = 2(2) + 3 = 4 + 3 = 7$$

$$f(x) = ax^2 - bx + 2$$

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

$$f(x-1) = ax^2 + a - 2ax - b(x-1) + 2$$

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

$$-2ax + b + a = 4x + 2$$

$$\begin{aligned} a &= -2a \\ a &= -3 \end{aligned}$$

$$\begin{aligned} a + b &= 2 \\ -3 + b &= 2 \\ b &= 5 \end{aligned}$$

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$$a - b = -3 - 5 = -8$$

$$f(3) = (3)^2 - 3(3) + 1 = 9 - 9 + 1 = 1$$

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

$$f(2) = (2)^2 - 3(2) + 1 = 4 - 6 + 1 = -1$$

$$\frac{2f(3) + f(-1)}{f'(2)} = \frac{2 \times 1 + 5}{(-1)^2} = \frac{2+5}{1} = \frac{7}{1} = 7$$

$$f(\varepsilon) \rightarrow \dots \rightarrow 3n+1 = f(n) \rightarrow 3(\varepsilon)+1 = 1\varepsilon+1 = 1\varepsilon$$

$$f(-2) \rightarrow \dots \rightarrow n^2 = f(n) \rightarrow (-2)^2 = 4$$

$$f(2) \rightarrow \dots \rightarrow 3n+1 = f(n) \rightarrow 3(2)+1 = 6+1 = 7$$

$$\frac{3f(\varepsilon) - 2f(-2)}{f'(2)} = \frac{3 \times 1\varepsilon - 2 \times 4}{7} = \frac{3\varepsilon - 8}{7} = \frac{3\varepsilon}{7} - \frac{8}{7}$$

$$\frac{f(\overbrace{f(\varepsilon)}^1) - f(\overbrace{f(3)}^2)}{\overbrace{f(1)}^1 - 2} = \frac{f(1) - f(2)}{1 - 2} = \frac{1 - 4}{-1} = \frac{-3}{-1} = 3$$

$$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2)^2 + \varepsilon(\sqrt{3}-2) + 9}{(\sqrt{3}-2)^2 + \varepsilon(\sqrt{3}-2) + 5} = \frac{3 + \varepsilon - \varepsilon\sqrt{3} + \varepsilon\sqrt{3} - 4 + 9}{3 + \varepsilon - \varepsilon\sqrt{3} + \varepsilon\sqrt{3} - 4 + 5} = \frac{8 + \varepsilon}{8 + \varepsilon} = 1$$

$$f(\overbrace{f(\sqrt{3}-2)}^2) = f(2)$$

$$f(2) = \frac{(2)^2 + \varepsilon(2) + 9}{(2)^2 + \varepsilon(2) + 5} = \frac{4 + 2\varepsilon + 9}{4 + 2\varepsilon + 5} = \frac{13 + 2\varepsilon}{9 + 2\varepsilon} = 1 + \frac{\varepsilon}{9}$$

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

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

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