

$$f(x) = \frac{1}{x} \Rightarrow f(x) > 0 \Rightarrow \frac{1}{x} > 0 \Rightarrow x > 0$$

$$f(x) = \frac{1}{x} \Rightarrow f(x) < 0 \Rightarrow \frac{1}{x} < 0 \Rightarrow x < 0$$

$$D_f = (-\infty, 0) \cup (0, \infty)$$

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$$\frac{f(x)}{f(x)} > 0 \Rightarrow f(x) > 0 \Rightarrow \frac{1}{x} > 0 \Rightarrow x > 0$$

$$\frac{f(x)}{f(x)} < 0 \Rightarrow f(x) < 0 \Rightarrow \frac{1}{x} < 0 \Rightarrow x < 0$$

$$D_f = (-\infty, 0) \cup (0, \infty)$$

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$$f(x) = \frac{1}{x} \Rightarrow f(x) = \frac{1}{x} \Rightarrow x = \frac{1}{f(x)}$$

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$$f(f(1)) + f(f(4))$$

$$1 < 2 \Rightarrow f(1) = 1 + 2 = 3$$

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

$$f(1) + f(4) = 3 + 2 = 5$$

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

$$1 < 2 \Rightarrow f(1) = 1 + 2 = 3$$

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

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

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

$$a(n-1)^2 + b(n-1) + c = 4n + 1$$

$$f(n-1) - f(n) = a(n-1)^2 + b(n-1) + c - (a(n-1)^2 + b(n-1) + c) = 0$$

$$= -2an + a + b = 4n + 1 \Rightarrow -2a = 4 \Rightarrow a = -2$$

$$a + b = -2 - 1 = -3$$

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

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

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

$$\frac{r f(r) + f(-1)}{f(r)}$$

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

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

$$\frac{r f(r) + 4}{-1} = \text{✓}$$

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$$\frac{r f(r) - r f(-r)}{f(r)}$$

$$r > r \Rightarrow f(r) = 2^r r + 1 = 1^r$$

$$-r < r \Rightarrow f(-r) = \underline{2}$$

$$f(r) = 2^r r + 1 = \underline{4}$$

$$\frac{r f(r) - r f(-r)}{f(r)} = \frac{r 1}{4}$$

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$$\frac{f(f(r)) - f(f(r))}{f(1) - r} = \frac{f(1) - f(r)}{4 - r} = \frac{4 - 4}{2} = 0$$

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$$f(n) = \frac{n^r + \varepsilon n + 9}{n^r + \varepsilon n + 4}$$

$$n^r + \varepsilon n + 4 \neq 0 \quad \text{---} \quad \text{نقطة 1}$$

$$f(\sqrt{r} - r) = \frac{(\sqrt{r} - r)^r + \varepsilon (\sqrt{r} - r) + 9}{(\sqrt{r} - r)^r + \varepsilon (\sqrt{r} - r) + 4} = \frac{r + \varepsilon - \varepsilon \sqrt{r} + \varepsilon \sqrt{r} - 1 + 9}{r + \varepsilon - \varepsilon \sqrt{r} + \varepsilon \sqrt{r} - 1 + 4} = \frac{1}{\varepsilon} = \underline{r^9}$$

$$f(r) = \frac{\varepsilon + 1 + 9}{\varepsilon + 1 + 4} = \frac{r 1}{14}$$

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

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

$$(n + \frac{1}{n})^r - (n^r + \frac{1}{n^r}) = n^r r \frac{1}{n^r} + r - n^r - \frac{1}{n^r} = r$$

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