

$$f(x) = \begin{cases} (a+1)(x+c) & \text{if } x < 0 \\ \frac{1}{x+c} & \text{if } x \geq 0 \end{cases}$$

$\Rightarrow f(0) = f(-c) = a \Rightarrow f((a+1)(0)) = ca + f(c) = a$
 $\Rightarrow 1(a+1)c = ca - c \Rightarrow 10a - 1$
 $\Rightarrow \frac{9}{10}$

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

$\Rightarrow \frac{(\sqrt{x-\sqrt{c}})^2 + 1}{\sqrt{x-\sqrt{c}}} + \frac{(\sqrt{x+\sqrt{c}})^2 + 1}{\sqrt{x+\sqrt{c}}} + x$
 $\Rightarrow \frac{(x-\sqrt{c})(\sqrt{x+\sqrt{c}}) + \sqrt{x+\sqrt{c}} + (x+\sqrt{c})(\sqrt{x-\sqrt{c}}) + \sqrt{x-\sqrt{c}}}{\sqrt{x-\sqrt{c}}\sqrt{x+\sqrt{c}}} + x$
 $\therefore$...

$$cf(x) - cf(x) = \epsilon x^c - x \Rightarrow (cf(x) - cf(-x) = \epsilon x^c - x) \times x^r$$

$\Rightarrow cf(x) - cf(x) = 10x^c - x$
 $cf(x) - 9f(x) = 10x^c - x$
 $\Rightarrow -8f(x) = 10x^c - x$
 $f(x) = \frac{10x^c - x}{-8}$
 $\Rightarrow -\epsilon x^r + \left(\frac{f(x)}{\Delta}\right)$

$$(x+c)f(x) - (x+c)f(x+c) = \epsilon x^c - mx + x^{m-1}$$

$cf(0) + 0 = cm - 1$
 $x=1 \Rightarrow (1+c)f(1) + cf(0) = (1+c)m + cm - 1$
 $cf(0) = \frac{1}{c} - \frac{1}{c} \Rightarrow \frac{1}{c} \Rightarrow f(0) = \frac{1}{c}$
 $cf(0) = 9m - c$
 $4f(0) = 10 + cm$
 $9m - c = 10 + cm$
 $9m - 10 = c(1+m)$
 $m=9$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{10x^c - 10x + x^c}{x} \Rightarrow f(-1) = ?$$

$\Rightarrow cf(-1) = \frac{10 + 10 + 1}{-1} \Rightarrow cf(-1) = -21$
 $f(-1) = -9$

$$f(x) = (x-1)\sqrt{1-x} \quad g(x) = -\sqrt{(1-x)^3} \quad D_f \Rightarrow 1-x \geq 0, \quad x \leq 1$$

$$D_g: 1-x \geq 0, \quad x \leq 1 \quad \Rightarrow \quad D_f \cap D_g$$

$$g(x) = -\sqrt{(1-x)^3} \Rightarrow -\sqrt{(1-x)^2(1-x)} \xrightarrow{\text{cancel}} -|1-x|\sqrt{1-x}$$

$$\text{نصفه } (x-1)\sqrt{1-x} \quad \Rightarrow \quad g(x) = f(x) \quad \text{نصفه}$$

$$f(x) = x\sqrt{x} \quad g(x) = \sqrt{x^3} \quad D_f: x \geq 0, \quad D_g: x \geq 0, \quad D_f \cap D_g$$

$$g(x) = \sqrt{x^3} = \sqrt{x^2 \cdot x} \xrightarrow{x \geq 0} x\sqrt{x} \Rightarrow g(x) = f(x)$$

$$f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \quad g(x) = \sqrt{x - \lfloor x \rfloor} \quad D_f: x \geq 0, \quad D_g: x \geq 0$$

$$\Rightarrow D_f \cap D_g \quad f(x) \Rightarrow \sqrt{x} - a \quad a = \lfloor \sqrt{x} \rfloor \quad a - \lfloor a \rfloor = \begin{cases} \text{if } a \in \mathbb{Z} \dots \\ \text{if } a \notin \mathbb{Z} \Rightarrow a < 1 \end{cases}$$

$$\begin{cases} \text{if } a \in \mathbb{Z} \Rightarrow [a - \lfloor a \rfloor] = 0 \\ \text{if } a \notin \mathbb{Z} \Rightarrow [a - \lfloor a \rfloor] = 0 \end{cases} \quad f(x) = g(x) = \sqrt{x - \lfloor x \rfloor} \Rightarrow x \geq 0 \Rightarrow \sqrt{0} = 0$$

$$\Rightarrow g(x) = f(x)$$

$$f(x) = g(x) = 0 \quad x=0$$

$$\left(\frac{f+g}{f-g} \right)(x) = \frac{x+x}{x-x} \Rightarrow \text{undefined}$$

$$\left(\frac{f+g}{f-g} \right)(1) \Rightarrow \frac{f(1)+g(1)}{f(1)-g(1)} = \frac{0}{0} \Rightarrow \text{undefined}$$

$$h(x) = f(x)$$

$$h(x) = \left\{ \left(\frac{1}{2}, 1 \right), \left(\frac{1}{4}, 1 \right), \left(\frac{1}{8}, 1 \right), \dots \right\}$$

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

$$g(x) = \left\{ \left(\frac{3}{2}, 1 \right), \left(\frac{5}{4}, 1 \right), \left(\frac{7}{8}, 1 \right), \dots \right\}$$

نصفه

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

$$\Rightarrow \sqrt{x} + \frac{1}{\sqrt{x}} + \sqrt{x} + \frac{1}{\sqrt{x}} = 2\sqrt{x} + \frac{2}{\sqrt{x}}$$

$$\frac{(\sqrt{x})^2 + 1}{\sqrt{x}} = \frac{x + 1}{\sqrt{x}} = \frac{x + 1}{\sqrt{x}} \cdot \frac{\sqrt{x}}{\sqrt{x}} = \frac{(x+1)\sqrt{x}}{x}$$

$$\Rightarrow \sqrt{x} + \frac{1}{\sqrt{x}} = \frac{(x+1)\sqrt{x}}{x}$$

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