

B

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برای هر

$$f(x) = \begin{cases} \cot \frac{\pi x}{f} & ; x < 1 \\ \sqrt{x^2 + 1} & ; x > 1 \end{cases}$$

$$f \circ f\left(\frac{1}{f}\right)$$

(2)

$$\frac{y}{\frac{1}{f}} = \frac{y}{f}$$

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

$$f\left(\frac{1}{x}\right) = \sqrt{\frac{x^2 - 1}{x^2}}$$

(2)

$$g(x) = x \cos x$$

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

$$f \circ g\left(\frac{M}{f}\right)$$

$$g\left(\frac{M}{f}\right) = \left(\frac{M}{f}\right)$$

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

$$f(x) = \sin x$$

$$g(x) = \frac{x}{1-x}$$

$$f \circ g(x)$$

$$\left[\frac{x}{1-x}\right] = \frac{x}{1-x}$$

$$\frac{f(x)}{1-f(x)} = \frac{\sin x}{1-\sin x} \rightarrow \frac{f(x)}{1-f(x)} = \frac{f(x)}{1-f(x)}$$

$$f(x) = \sin x$$

$$g \circ f\left(\frac{M}{f}\right)$$

(2)

$$g(x) = x \sqrt{1-x^2}$$

$$\frac{f(x)}{\sqrt{1-f(x)^2}} = \frac{1}{f(x)} \checkmark$$

$$f(x) = \{(x, 1), (x, r), (x, d), (1, v)\}$$

$$g(x) = \{(b, r), (r, 1), (a, v), (b, 1)\}$$

(2)

$$(f, 1) \in f \circ g, (f, 1) \in g \circ f$$

$$(f, d) \checkmark$$

$$\downarrow \checkmark x = f \rightarrow \frac{1}{f}$$

$$\downarrow \checkmark b \rightarrow \frac{1}{b} f(r) = d$$

$$g(f) = x$$

$$g(d) = 1$$

Scbó

$$g(a) = \{(f, 4), (r, f), (4, 1), (1, 0)\}, \quad f(a) = \{(f, 0), (4, 0), (1, 1), (r, 1)\}$$

$$f \circ g(a) = \{(f, 0), (r, 0), (4, 1), (1, 1)\} \quad \checkmark$$

$$g \circ f(a) = \emptyset \quad \checkmark$$

$$f \circ f(a) = \emptyset \quad \checkmark$$

$$g \circ g(a) = \{(f, 1), (r, 4), (4, 1)\} \quad \checkmark$$

$$f(f(a)) = \{r, f\}$$

$$g \circ f(-1)$$

4- اگر f و g خطی باشد

$$g(r, r) = r, -r$$

$$a(ax+b)+b = f_a, r$$

$$a^2x+ab+b = f_a, r$$

$$a^2 = f$$

$$a = \pm f \quad \begin{cases} f_a + rb = f_a, r \Rightarrow b = 1 \\ f_a - b = f_a, r \Rightarrow b = -r \end{cases}$$

$$f(a) = r, a + 1 = r(-1) + 1 = -1$$

$$f(a) = -r, a - r = -r(-1) - r = -1$$

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

$$r, a + r, a - 1$$

$$r, a = -f$$

$$(a = -1)$$

$$g(-1) = -1$$

$$f(-a) = \sqrt{a+|a|}$$

$$g(a) = \frac{1}{a^2 - f_a}$$

مقادیر برگردان $a+|a|$

$$|a+|a|| = f\sqrt{a+|a|}$$

$$\frac{1}{a}$$

$$|a+|a|| = f\sqrt{a+|a|}$$

$$\frac{1}{a} = \frac{1}{f} + Df = R^+ - \{1\} \quad \checkmark$$

$$f(a) = \sqrt{1-a^2} \quad D_f = \{ -a^2 \} \quad \frac{-1}{2} \cdot \frac{1}{-2a} = \frac{1}{4a} \quad (2) \rightarrow 1$$

$$g(a) = \sqrt{a} \quad D_g = \{ a \} \quad R f(a) = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \quad \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$\sqrt{1-a^2} + \sqrt{a} \Rightarrow \sqrt{1-1-a^2} + \sqrt{1-a^2} \quad D(f+g) \circ f = \begin{bmatrix} 1 \\ 1 \end{bmatrix} \checkmark$$

$$f\left(\frac{r+1}{2-r}\right) = f(r) \quad \frac{r+1}{2-r} = r \quad r = \frac{r+1}{2-r} \Rightarrow \frac{r+1}{2-r} = r \quad (2) \rightarrow 9$$

$$f(a) = \frac{1-r-1}{2-r} \checkmark$$

$$f\left(\frac{r+1}{2-r}\right) = r \quad \frac{1+r+2r-1}{2-r} = \frac{1+r-1}{2-r}$$

$$f\left(a + \frac{1}{a}\right) = a^r + \frac{1}{a^r} \quad a + \frac{1}{a} = r \quad +^r = r^r \quad \left(a + \frac{1}{a}\right)^r = r^r \left(a + \frac{1}{a}\right)$$

$$f(r) = r^r \cdot r \Rightarrow f(a) = a^r \cdot r \checkmark$$

$$g(a) = 1, \sqrt{r}$$

$$(2) \rightarrow 1$$

$$f(a) = a\sqrt{a}$$

$$g(f(a)) = \cdot$$

$$f(a) = 1 \rightarrow a\sqrt{a} = 1 \Rightarrow \sqrt{a^3} = 1 \Rightarrow a = 1 \checkmark$$

$$f(a) = \sqrt{r} \rightarrow a\sqrt{a} = \sqrt{r} \Rightarrow \sqrt{a^3} = \sqrt{r} \Rightarrow a = r \checkmark$$

$$(a_1 - a_2) = (1 - 1) = 0 \checkmark$$