

9 14, 25

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$$f \circ f\left(\frac{\pi}{3}\right) = 2$$

۱- (۲)

$$f\left(\frac{\pi}{3}\right) = \cot\left(\frac{\frac{\pi}{3}\pi}{\frac{\pi}{2}}\right) = \cot\left(\frac{\pi}{2}\right) = \frac{\cos \frac{\pi}{2}}{\sin \frac{\pi}{2}} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$$

$$f(\sqrt{3}) = \sqrt{3+1} = 2 \quad \checkmark$$

$$g\left(\frac{\pi}{3}\right) = 2 \times \cos \frac{\pi}{6} = 2 \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{2}$$

۲- الف (۲)

$$f\left(\frac{1}{2}\right) = \sqrt{\frac{2 \times 2 - 1}{2 \times 2}} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2} \quad \checkmark$$

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

$$f\left(\frac{\sqrt{2}}{1 - \sqrt{2}}\right) = \left[\frac{\sqrt{2}}{1 - \sqrt{2}} \right] \approx \left[\frac{1.4}{1 - 1.4} \right] \approx$$

$$[-3.5] = -4 \quad \checkmark$$

کانتینجی

$$f\left(\frac{\pi}{2}\right) = \sin\left(\frac{\pi}{2}\right) = \frac{\sqrt{2}}{2} \quad g\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}}{2} \times \sqrt{1 - \frac{1}{2}} =$$

$$\sqrt{\frac{1}{2} \times \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}} = \sqrt{\frac{1}{2}} = \frac{1}{2} \quad \checkmark$$

$$f \circ g(x) = \{(1, 0), (2, 0), (4, 1), (8, 1)\} \quad \checkmark$$

۳- الف (۲)

$$g \circ f(x) = \{\emptyset\} \quad \checkmark$$

ب (۲)

$$f \circ f(x) = \{\emptyset\} \quad \checkmark$$

ج (۲)

$$g \circ g(x) = \{(1, 1), (2, 2), (4, 1)\} \quad \checkmark \quad \checkmark$$

د (۲)

dn

Date

No

$$(\varepsilon, 2) \in f \circ g$$

$$g(\varepsilon) = 1$$

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

-a

$$\Rightarrow a = \varepsilon$$

(2)

$$a = \varepsilon \quad \checkmark$$

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

$$f(\varepsilon) = a$$

$$g(a) = 1$$

$$b = a$$

$$(a, b) = (\varepsilon, a)$$

$$b = a \quad \checkmark$$

$$g(2x+3) = 3x-2$$

(2)

$$f(x) = ax + b$$

$$f(f(x)) = a(ax+b) + b = a^2x + ab + b = 2x+3 \Rightarrow a^2 = 2$$

$$a = -2 \Rightarrow -2b + b = 3$$

$$a = \pm 2$$

$$-b = 3$$

$$b = -3$$

$$\Rightarrow f(x) = -2x - 3$$

$$2x+3 = -1$$

$$2 = -2x-3$$

$$x = -5$$

$$x = -5$$

$$x = -5$$

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می توانیم

به جایی ۲-۲

قرار می دهیم

جواب فرقی ندارد.

$$|x + |x|| = \varepsilon \sqrt{x + |x|}$$

$$|x| + x \geq 0$$

$$R - \{1\}$$

(1, 1/2)

$$\frac{0}{0} \rightarrow x$$

$$R \checkmark$$

$$\frac{1}{x^r - \varepsilon x} \Rightarrow x^r \neq \varepsilon x$$

$$x \neq 0, r \rightarrow f(x) \neq 0 \quad x > 0 \quad f(x) \neq r \rightarrow x \neq 1$$

$$|x| + x \neq \varepsilon \sqrt{x + |x|}$$

$$R - \{1\}$$

$$x^r + x^r + r x |x| \neq |x| + |x|$$

$$r x^r + r x |x| \neq |x| + |x|$$

$$\varepsilon x^r \neq r x$$

$$\{x \in D_f, f(x) \in D_g\} \rightarrow (0, +\infty) - \{1\}$$

$$f(x) = \sqrt{1-x^r}$$

$$D_f: 1 \geq x^r \Rightarrow -1 \leq x \leq 1 \quad (1)$$

$$f(x) = \sqrt{1-x^r}$$

$$g(x) = \sqrt{x}$$

$$D_g: x \geq 0$$

$$f \circ f(x) = -1 \leq \sqrt{1-x^r} \leq 1 \Rightarrow D_{f \circ f} = [-1, 1] \quad (2)$$

$$g \circ f(x) = 0 \leq \sqrt{1-x^r} \Rightarrow D_{g \circ f} = [0, 1] \quad (3)$$

$$(1) \cap (2) = [-1, 1] \quad (4)$$

$$f\left(\frac{x+1}{x-r}\right) = \varepsilon x + \omega$$

$$\frac{rx+1}{x-r} = t \Rightarrow x = \frac{r+1}{r-t} \quad (5) \quad (6) \quad (7)$$

$$\varepsilon x + \omega = \frac{1+r+\varepsilon}{r-t} + \omega = \frac{1+r-r\varepsilon+r\varepsilon}{r-t} = 1 + \frac{r\varepsilon}{r-t} = \frac{1+r\varepsilon}{r-t} \quad (8)$$

$$f\left(x + \frac{1}{x^r}\right) = x + \frac{1}{x^r} \quad t = x + \frac{1}{x^r} \Rightarrow x + \frac{1}{x^r} = t - r + t \Rightarrow \quad (9)$$

$$f(x) = x - rx \quad (10)$$

$$g(1) = 0$$

$$g(\sqrt{x}) = 0$$

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

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

$$\rightarrow f(x) = \sqrt{x} = x\sqrt{x} \Rightarrow x = \sqrt{x}$$

$$x_2 - x_1 = \sqrt{x} - 1 = 1 \quad \checkmark$$

(2) (-1)