

$$g \circ g \circ m = \begin{matrix} x \rightarrow y \rightarrow z \\ y \rightarrow z \rightarrow y \\ z \rightarrow y \rightarrow x \end{matrix} \quad g \circ g \circ m = \{(x, y), (y, z), (z, x)\}$$

$$f \circ g \circ m = \begin{matrix} x \rightarrow y \rightarrow z \\ y \rightarrow z \rightarrow y \\ z \rightarrow y \rightarrow x \end{matrix} \quad f \circ g \circ m = \{(x, y), (y, z), (z, x)\}$$

$$g \circ f \circ m = \begin{matrix} x \rightarrow y \rightarrow z \\ y \rightarrow z \rightarrow y \\ z \rightarrow y \rightarrow x \end{matrix} \quad g \circ f \circ m = \{(x, y), (y, z), (z, x)\}$$

$$f \circ m = a + b \quad f \circ f \circ m = \dots$$

$$f(a + b) = \{a + b\} \rightarrow \{a + b\} + b$$

$$g(x + y) = x + y \quad y + x = z \rightarrow x = \frac{z - y}{2}$$

$$g(x) = \frac{y - x}{2} \rightarrow \frac{y - x}{2} = \frac{y - x - 1}{2}$$

$$D = \{x \in \mathbb{R} \mid x \in \mathbb{Q}\} \quad \sqrt{x} = \sqrt{x}$$

$$D_f = [-1, 1], D_g = [0, \infty) \Rightarrow D_{f+g} = [0, 1]$$

$$D = \{x \in [-1, 1] \mid 0 \leq \sqrt{1-x} \leq 1\}$$

$$0 \leq \sqrt{1-x} \leq 1 \rightarrow 1-x \leq 1 \rightarrow -x \leq 0$$

$$D_{f+g} \circ f = [-1, 1]$$

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

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

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

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

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

$$\sqrt{2} \in \mathbb{R}$$

(19,0)

سوال 19

$$f\left(f\left(\frac{1}{\sqrt{2}}\right)\right) = \sqrt{(\sqrt{2})^2 + 1} = \sqrt{3} = 1 \quad (1)$$

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

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

$$f(g(n)) = \left[\frac{n}{1-n} \right] \xrightarrow{n=\sqrt{2}} \left[\frac{\sqrt{2}}{1-\sqrt{2}} \right] \xrightarrow{1, \frac{1}{\sqrt{2}}} \left[\frac{\sqrt{2}}{1-\sqrt{2}} \right]$$

$$\left[\frac{\sqrt{2}}{1-\sqrt{2}} \times \frac{1+\sqrt{2}}{1+\sqrt{2}} \right] = \left[\frac{\sqrt{2} + 2}{1-2} \right] = \left[\frac{-2-\sqrt{2}}{-1} \right] = -2-\sqrt{2} = -\frac{1}{\sqrt{2}} \quad (4)$$

$$g \circ f(n) = g(f(n)) = \sin n \sqrt{1 - \sin^2 n} = \sin n \cos n \quad (5)$$

$$\sin n \cos n \xrightarrow{n=\frac{\pi}{4}} \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{2}{4} = \frac{1}{2} \quad (6)$$

$$f \circ g(n) = \begin{matrix} g(n) \\ \downarrow \\ f \end{matrix} \begin{matrix} \epsilon \rightarrow \alpha \\ \gamma \rightarrow \omega \\ \eta \rightarrow \pi \\ \iota \rightarrow \kappa \end{matrix} \rightarrow \begin{matrix} \alpha \\ \omega \\ \pi \\ \kappa \end{matrix} \quad f \circ g(n) = \{(\epsilon, \alpha), (\gamma, \omega), (\eta, \pi), (\iota, \kappa)\} \quad (7)$$

$$g \circ f(n) = \begin{matrix} f \rightarrow \alpha \\ \gamma \rightarrow \omega \\ \eta \rightarrow \pi \\ \iota \rightarrow \kappa \end{matrix} \quad (8)$$

$$f \circ f(n) = \begin{matrix} \epsilon \rightarrow \alpha \\ \gamma \rightarrow \omega \\ \eta \rightarrow \pi \\ \iota \rightarrow \kappa \end{matrix} \quad (9)$$

PASARGAD

DATE: _____