

2.

دیس میں سے

$$f(m) = \begin{cases} \cos \frac{\pi}{2} m & m < 1 \\ \sqrt{m+1} & m > 1 \end{cases}$$

$$f\left(\frac{1}{\sqrt{2}}\right) = \frac{\pi \frac{1}{\sqrt{2}}}{\frac{1}{2}} = \frac{\pi}{\sqrt{2}} \rightarrow \text{let } \frac{\pi}{\sqrt{2}} = \sqrt{2}$$

$$f(\sqrt{2}) = \sqrt{(\sqrt{2})^2 + 1} = 2$$

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

$$f(m) = [m] \rightarrow [-1, 2] \rightarrow -1$$

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

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

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

$$g(m) = \cos m \rightarrow \cos \frac{\pi}{2} = 0$$

$$g\left(\frac{\pi}{2}\right) = \frac{\sqrt{2}}{2}$$

$$f(m) = \sin m \rightarrow \sin\left(\frac{\pi}{2}\right) = \frac{\sqrt{2}}{2}$$

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

$$g\left(\frac{\pi}{2}\right) = \frac{1}{2}$$

$$f \circ g(m) = \{(1, 2), (2, 1), (3, 2), (2, 3)\} \quad g \circ f(m) = \emptyset$$

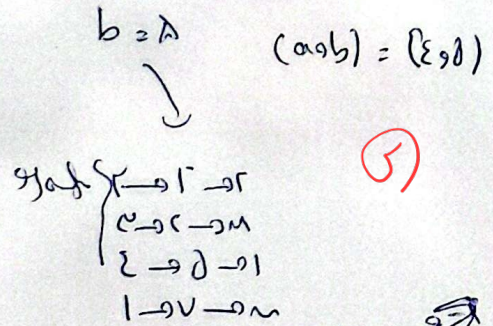
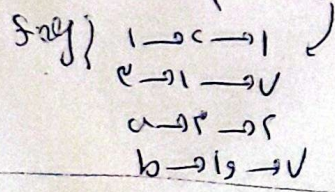
$$g \circ f(m) = \{(2, 1), (1, 2), (3, 1), (1, 3)\} \quad f \circ g(m) = g$$

$$f(m) = \{(1, 2), (2, 3), (3, 1)\}$$

$$g(m) = \{(1, 2), (2, 3), (3, 1)\}$$

$$(2, 3) \rightarrow f \circ g$$

$$(3, 1) \rightarrow g \circ f$$



$$f(m+1) = 2m+1 \rightarrow a(m+1) + b \rightarrow a \cdot m + ab + b$$

$$g(m+1) = m-1 \rightarrow a(m+1) + b \rightarrow a \cdot m + a + b \rightarrow m-1$$

$$f(m) = m+1 \quad g(m) = \frac{m}{2} - \frac{1}{2}$$

$$a = \frac{2}{2} \quad b = -\frac{1}{2}$$

$$f(-1) = -1+1 = 0 \quad g(-1) = -\frac{1}{2}$$

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

$$v) f(x) = \sqrt{x+|x|} \rightarrow g(x) = \frac{1}{x^2 - 2x}$$

$$D_{f \circ g} = \{x \in D_g, f(x) \in D_f\} \rightarrow \begin{cases} x \in \mathbb{R} \\ \sqrt{x+|x|} \in \mathbb{R} - \{0, 1\} \end{cases} \rightarrow D_{f \circ g} = (0, +\infty) - \{1\}$$

$$D_f = x+|x| \geq 0 \rightarrow D_f = \mathbb{R}$$

$$D_g = x^2 - 2x \neq 0 \rightarrow x(x-2) \neq 0 \rightarrow \begin{cases} x \neq 2 \\ x \neq 0 \end{cases} \rightarrow \begin{cases} x+|x| \neq 0 \rightarrow x \in \mathbb{R} - \{0\} \\ x+|x| \neq 1 \rightarrow x \neq 1 \end{cases}$$

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

$$D(f \circ g) \rightarrow \{x \in D_g, f(x) \in D_f\} \rightarrow \begin{cases} x \in [-1, 1] \\ \sqrt{x} \in [-1, 1] \end{cases} \rightarrow D = [-1, 1]$$

$$D_{f \circ g} \rightarrow 0 \leq 1-x^2 \leq 1 \rightarrow x \in [-1, 1]$$

$$D_{f \circ g} = D_f \cap D_g \rightarrow [-1, 1] \cap [0, +\infty) \rightarrow [-1, 1] \quad \begin{matrix} D_g = x \geq 0 \\ D_f = [-1, 1] \end{matrix}$$

$$a) f\left(\frac{x+1}{x-1}\right) = 2x+1$$

$$\frac{x+1}{x-1} = t$$

$$\frac{t+1}{t-1} \rightarrow f(t) = 2$$

$$\rightarrow \left(\frac{t+1}{t-1}\right) + 1 = \frac{t+2}{t-1} \rightarrow 1$$

$$f(x) = \frac{x+2}{x-1} + 1$$

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

$$x + \frac{1}{x} = t$$

$$\left(x + \frac{1}{x}\right)^2 - 2 = t^2 - 2 \rightarrow t^2 - 2 = t$$

$$f(x) = t^2 - 2 = t$$

$$10) f(x) = x\sqrt{x}$$

$$g \circ f(x) \rightarrow g(f(x)) =$$

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

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

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

$$xc - x_1 = p - 1 = 1$$