

دایره ای و صیغه (ثروا)

$$f\left(\frac{1}{\sqrt{3}}\right) \rightarrow \cot \frac{1}{\sqrt{3}} \rightarrow \cot \frac{1}{\sqrt{3}} \rightarrow \cot \frac{\pi}{6} \rightarrow \sqrt{3}$$

$$f(\sqrt{3}) \rightarrow \sqrt{3+1} \rightarrow 2$$

-1

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

-2 الف

$$g(\sqrt{2}) \rightarrow \frac{\sqrt{2}}{1-\sqrt{2}} \times \frac{1+\sqrt{2}}{1+\sqrt{2}} \rightarrow \frac{\sqrt{2}+2}{1-2} \rightarrow -\sqrt{2}-2 \rightarrow f(-\sqrt{2}-2) \rightarrow [-\sqrt{2}-2] = -3$$

ج

$$f\left(\frac{2}{\sqrt{3}}\right) \rightarrow \sin \frac{2}{\sqrt{3}} \rightarrow \frac{\sqrt{2}}{\sqrt{3}} \quad g\left(\frac{\sqrt{2}}{\sqrt{3}}\right) \rightarrow \frac{\sqrt{2}}{\sqrt{3}} \sqrt{1-\frac{2}{3}} \rightarrow \frac{\sqrt{2}}{\sqrt{3}} \sqrt{\frac{1}{3}} \rightarrow \sqrt{\frac{2}{3} \times \frac{1}{3}} \rightarrow \sqrt{\frac{2}{9}} = \frac{\sqrt{2}}{3}$$

-3

$$f \circ g(x) \rightarrow \{(4,0)(2,0)(1,1)(1,1)\}$$

-4

$$g \circ f(x) \rightarrow \emptyset \quad f \circ f \rightarrow \emptyset \quad g \circ g(x) \rightarrow \{(4,1)(2,4)(4,1)\}$$

$$(4,2) \in f \circ g: 2 \rightarrow 3 \rightarrow a=4 \Rightarrow (4,0)$$

$$(4,1) \in g \circ f: 4 \xrightarrow{f(x)} 2 \xrightarrow{g(x)} 1$$

برعکس حساب می کنیم

$$f(f(x)) = 4x + 3 \rightarrow f(x) = 2x + 1$$

-5

$$g(2x+3=t) \Rightarrow g(t) = 3\left(\frac{t-3}{2}\right) - 2 \rightarrow g(t) = \frac{3t-9}{2} - 2 \rightarrow g(x) = \frac{3x-13}{2}$$

$$f(-1) \rightarrow -2+1 = -1 \rightarrow g(-1) \Rightarrow \frac{3-13}{2} = -5$$

$$g \circ f \rightarrow \frac{1}{(\sqrt{x+|x|})^2 - 2\sqrt{x+|x|} + 1 - 2} \rightarrow \frac{1}{(\sqrt{x+|x|} - 2)^2 - 3} \rightarrow \sqrt{x+|x|} = 0 \rightarrow x \leq 0$$

$$D_{g \circ f} = (0, +\infty) - \left\{ \frac{-1 \pm \sqrt{1+4\sqrt{9x}}}{2} \right\} \leftarrow \frac{-1 \pm \sqrt{1+4\sqrt{9x}}}{2} \leftarrow x+|x|-16=0 \leftarrow \sqrt{x+|x|}=4$$

$$\sqrt{1-x^2} + \sqrt{x} \rightarrow \sqrt{1-(\sqrt{1-x^2})^2} + \sqrt{\sqrt{1-x^2}} \rightarrow \sqrt{1-1+x^2} \rightarrow |x|$$

$$\frac{-1 \pm \sqrt{1-x^2}}{2} \leftarrow 1-x^2 \geq 0 \leftarrow \sqrt{1-x^2} \geq 0 \leftarrow |x| + \sqrt{1-x^2}$$

$$-1 \pm 1 \rightarrow D_{(f \circ g) \circ f} = [-1, 1]$$

-6

$$f\left(\frac{3x+1}{x-2}\right) = 2x+5 \rightarrow tx-2t = 3x+1 \rightarrow tx-3x = 2t+1, f(t) = \frac{1t+2}{2t-1} + 5$$

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

$$f(x) = x - \frac{1}{x} - \frac{1}{x} \quad f(x) = \frac{1x+2}{2x-1} + 5$$

-7

$$f(x) = \sqrt{x} \rightarrow x \geq 0$$

-10

$$\sqrt{x^2} = 2 \Rightarrow x = 2$$

$$\sqrt{x^2} = 1 \rightarrow x = 1 \quad \swarrow \quad 1-1 = \textcircled{1}$$