

$$f \circ f\left(\frac{2}{3}\right) \rightarrow f\left(f\left(\frac{2}{3}\right)\right) \rightarrow f\left(\cot \frac{\pi}{6}\right) = f(\sqrt{3})$$

$$\boxed{2}, \sqrt{3^2+1} \quad \leftarrow \begin{matrix} x > 1 \\ \downarrow \\ \sqrt{x^2+1} \end{matrix}$$

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

$$\sqrt{\frac{4-1}{4}} \xleftarrow{x \cdot 2} f\left(\frac{1}{2}\right) \xleftarrow{2(x)} f\left(2\left(\frac{1}{3}\right)\right) \xleftarrow{f \circ 2} f\left(\frac{1}{3}\right) \quad \text{الف)}$$

$$\boxed{\frac{\sqrt{3}}{2}}$$

$$f\left(\frac{\sqrt{2}}{1-\sqrt{2}}\right) \xleftarrow{2(x) \cdot \frac{x}{1-x}} f\left(2(\sqrt{2})\right) \xleftarrow{f \circ 2} f\left(\sqrt{2}\right) \quad \text{ب)}$$

$$\xleftarrow{f} f\left(\frac{\sqrt{2}+2}{1-2}\right) \rightarrow f(-\sqrt{2}-2) \quad \boxed{-4}$$

$$2 \circ f\left(\frac{\pi}{4}\right) \rightarrow 2\left(f\left(\frac{\pi}{4}\right)\right) \xrightarrow{\sin \frac{\pi}{4}} 2\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}}{2} \sqrt{1-\frac{2}{4}}$$

$$\boxed{\frac{2}{4}, \frac{1}{2}}$$

$$\text{الف)} f \circ 2(x), \{(4,5), (2,5), (6,12), (8,12)\}$$

$$\text{ب)} 2 \circ f(x), \emptyset$$

$$\text{ج)} f \circ f(x), \emptyset$$

$$\text{د)} 2 \circ 2(x), \{(4,8), (2,6), (6,10)\}$$

$$f \circ 2 \rightarrow f(2(x)) \xrightarrow{(4,2)} f(2(4)) = f(3) \cdot 2$$

$$\boxed{a, 4} \leftarrow 3 \cdot 2(4) \leftarrow$$

$$2 \circ f \rightarrow 2(f(x)) \xrightarrow{(4,1)} 2(f(4)) \cdot 2(b) \rightarrow f(4) \cdot 5$$

$$(a,b), \boxed{(4,5)} \quad \boxed{b, 5} \leftarrow$$

$$2(2x+3), 3x-2, f \circ f, 4x+3$$

$$\hookrightarrow f(x), 2x+1$$

$$\hookrightarrow 2 \circ f(-1) = 2(f(-1)), 2(-1) \xrightarrow{x=-2} 2(-1), -6-2 \boxed{-8}$$

$$\{D_{2 \circ f} \in D_f, R_f \in D_2\}$$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ \mathbb{R} & [0, +\infty) & \mathbb{R} - \{0, 4\} \end{array}$$

8 و 0 باید حذف شوند

$$0, 4 \xrightarrow{0, 8} \sqrt{x+|x|}$$

$$D_{2 \circ f}, (0, +\infty) - 8$$

$$\{D_{f \circ g} \in D_f, R_f \in D_{2+f}\}$$

$$1-x^2 \geq 0$$

$$-1 \leq x \leq 1$$

از -1 و 1 می رسم

$$f(x)$$

$$x \geq 0, 1-x \leq x \leq 1$$

$$\boxed{0 \leq x \leq 1}$$

$$\rightarrow D_{f \circ g}, [1, 1]$$

$$\text{الف) } f\left(\frac{3x+1}{x-2}\right), 4x+5 \rightarrow \frac{3x+1}{x-2} \cdot t = 3x+1, t \cdot x-2t$$

$$\boxed{f(x), \frac{13x-11}{x-3} + 5} \xleftarrow{x(3-t), (1+2t)} x \cdot \frac{1+2t}{t-3}$$

$$\boxed{f(x), x^3 - 3x}$$

$$\text{ب) } f\left(x + \frac{1}{x}\right), x^3 + \frac{1}{x^3} \rightarrow x + \frac{1}{x} \cdot t = t^3, x^3 + \frac{1}{x^3} + 3x + \frac{3}{x} \rightarrow t^3 - 3t \uparrow$$

$$\text{ریشه ها این} \leftarrow 2(f(x)) \leftarrow f(x), x\sqrt{x}, 2\sqrt{2}, 1$$

$$\boxed{2, 1, 1} \leftarrow \boxed{x_2=2, x_1=1} \text{ تابع باید } f(x), 1, 2\sqrt{2} \text{ شود}$$