

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

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

$$f\left(\sqrt{2}\right) = f\left(\frac{\sqrt{2}}{1-\sqrt{2}}\right) = \left[\frac{\sqrt{2}}{1-\sqrt{2}}\right] = [-2, 4, \dots] = -4$$

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

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$$f \circ g(x) : \{(4, 2), (2, 8), (4, 12), (8, 12)\}$$

$$g \circ f(x) : \emptyset \quad \text{د) } f \circ f(x) = \emptyset \quad \text{ب) } g \circ g(x) : \{(4, 8), (2, 6), (4, 0)\}$$

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$(4, 4) \in f \circ g \rightarrow a=4 \quad (4, 1) \in g \circ f \rightarrow b=4$
 $\rightarrow (a, b) = (4, 4)$

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$$f \circ f(x) = a(ax+b)+b = \textcircled{a}x + \textcircled{a}b + b \rightarrow b = 1 \textcircled{a} - \textcircled{a}$$

$$\textcircled{a}x + \textcircled{a}b + b \rightarrow f(x) = \textcircled{a}x + 1 / -\textcircled{a} - \textcircled{a}$$

$$a = \textcircled{a} - \textcircled{a}$$

$$f(-1) = -1$$

$$(a, b, c, d) \rightarrow g(-1) = \textcircled{a}(-1) - \textcircled{a} = \textcircled{-1}$$

$$\textcircled{a} + \textcircled{a} = -\textcircled{a}$$

$$D_{g \circ f}: D_f \cap f(x) \in R_g$$

$$\textcircled{\mathbb{R}} \quad \sqrt{x+1} \quad \mathbb{R} - \{0\}$$

$$\sqrt{x+1} \rightarrow \neq 0 \rightarrow \textcircled{x > 0} \rightarrow D_{g \circ f} = (0, +\infty) - \{1\}$$

$$\sqrt{x+1} \rightarrow \pm \neq \rightarrow \textcircled{x \neq 1}$$

$$(f+g) \circ f$$

$$x \in (D_f \cap D_g)$$

$$[-1, 1] \cap [0, +\infty) = [0, 1]$$

$$\sqrt{1-x^2} \in [0, 1] \rightarrow 0 \leq 1-x^2 \leq 1$$

$$\textcircled{-1 \leq x \leq 1}$$

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

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

$$\frac{rx+1}{x-r} = t \rightarrow x = \frac{t+rt+1}{t-r} \rightarrow f(x) = f\left(\frac{t+rt+1}{t-r}\right) + d = \frac{1rx-11}{rx-r}$$

$$\left(\frac{x+1}{x}\right)^r = \underbrace{x^r + \frac{1}{x^r}}_{f(t)} + r \underbrace{\left(\frac{x+1}{x}\right)}_t \quad f(x) = x^r - rx$$

$$x_1, \sqrt{x_1} = 1 \rightarrow x_1 = 1 \rightarrow g \circ f(x_1) = \textcircled{1}$$

$$x_2, \sqrt{x_2} = \textcircled{\sqrt{2}} \rightarrow x_2 = \textcircled{2} \rightarrow g \circ f(x_2) = \textcircled{2}$$