

$$f(x) = \begin{cases} x^2 + 1 & x \geq 0 \\ x & x < 0 \end{cases} \rightarrow f^{-1}(x) = \begin{cases} \sqrt{x} & x \geq 1 \\ x & x < 1 \end{cases}$$

$$f^{-1}(x) = \frac{1/0 \cdot x}{1} - \frac{0/0}{1} |x| = \frac{1/0 \cdot x}{1} - \frac{0}{1} |x| \rightarrow a = \frac{1/0}{1/0} = \frac{1}{1} \rightarrow \frac{1}{1} x - \frac{1}{1}$$

$$b = -\frac{0}{1/0} = -\frac{1}{1} \quad \checkmark = -\frac{1}{1}$$

$$f(x) = \frac{x^2 + f}{x + m} \rightarrow f(1) = -10 = \frac{1^2 + f}{1 + m} \rightarrow -10 - \frac{1 + f}{1 + m} = 10 \rightarrow 10m = -10 - 1 - f \rightarrow m = -\frac{11 + f}{10}$$

$$\rightarrow f(x) = \frac{x^2 + f}{x - 11} \cdot x \neq +11 \quad \frac{-10/1, x \neq 11}{x \neq 11} \quad f(-10) = \frac{-10^2 + f}{-11} = \frac{-100 + f}{-11} = 10 \rightarrow f = 110$$

$$f^{-1}(x) = \frac{x^2 + f}{x - 11}, x \neq 11$$

$$y = f \circ f^{-1}(x) = x + \frac{x^2 + f}{x - 11} = x \rightarrow \frac{x^2 + f}{x - 11} = 0 \rightarrow x^2 + f = 0 \rightarrow x = -\frac{f}{x} \quad \checkmark$$

$$f \circ f^{-1}(x) = 1 - f \left(\frac{x}{f} \right) \rightarrow g \left(\frac{x}{f} \right) = 1 - f \left(\frac{x}{f} \right) \rightarrow g(x) = 1 - f \left(\frac{x}{f} \right)$$

$$f^{-1}(1 - f) = 1 - f \Rightarrow f^{-1}(1 - f) = 1 - f \Rightarrow g(x) = 1$$

$$g^{-1}(1) = x \rightarrow f \circ g^{-1}(1) = 1 - f \left(\frac{x}{f} \right) \rightarrow f \circ g^{-1}(1) = 1 - f \left(\frac{x}{f} \right) \rightarrow$$

$$f \circ g^{-1}(1) + f \left(\frac{x}{f} \right) = 1 \quad \checkmark$$

$$y = \frac{ax - 1}{1 - x} \rightarrow y = \frac{-ax - 1}{1 + x} \rightarrow y = \frac{ax + 1}{1 + x} \rightarrow \frac{ax + 1}{1 + x} = \frac{ax + 1}{1 + x} \rightarrow \frac{ax + 1}{1 + x} = \frac{ax + 1}{1 + x}$$

$$\frac{ax + 1}{1 + x} - 1 = \frac{ax + 1 - 1 - x}{1 + x} = \frac{ax - x}{1 + x} = \frac{x(a - 1)}{1 + x} = f(x) \rightarrow f^{-1}(x) \rightarrow x = \frac{y + 1}{y - 1} \rightarrow xy - x = y + 1$$

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

$$\frac{y + 1}{y - 1} = \frac{y + 1}{y - 1} \rightarrow y^2 + y - 1 = y^2 + y - 1 \rightarrow y^2 - y - 1 = 0$$

$$\rightarrow y = \frac{1 \pm \sqrt{5}}{2} \rightarrow y = \frac{1 + \sqrt{5}}{2} \rightarrow y = \frac{1 + \sqrt{5}}{2}$$

$$f(x) = x + f[x] \cdot g(x) = f^{-1}(x) \rightarrow$$

$$y = x + f[x] \cdot f^{-1}(x) \rightarrow x = y + f[y] \rightarrow x = x - f[y] \rightarrow f^{-1}(x) = x - \frac{f}{x} [x]$$

$$\frac{[x]}{x} = [y] \quad f(x) - f^{-1}(x) = x + f[x] - x + \frac{f}{x} [x] = \frac{f}{x} [x] \quad \checkmark$$