

Exercise 84

Let $f(x) = \frac{1}{x}$.

- (a) Find $(f \circ f)(x)$.
- (b) Is $(f \circ f)(x)$ for any function f the same result as the answer to part (a) for any function? Explain.
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Solution

Write $(f \circ f)(x)$.

$$\begin{aligned}(f \circ f)(x) &= f(f(x)) \\ &= \frac{1}{\frac{1}{x}} \\ &= 1 \times \frac{x}{1} \\ &= x\end{aligned}$$

$(f \circ f)(x)$ in general is not equal to x . It is only if $f(x)$ is its own inverse: $f(x) = f^{-1}(x)$.