Exercise 82

For the following exercises, use $f(x) = x^3 + 1$ and $g(x) = \sqrt[3]{x - 1}$.

What is the domain of $(g \circ f)(x)$.

Solution

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

$$
\begin{aligned}
(g \circ f)(x) &= g(f(x)) \\
&= \sqrt[3]{(x^3 + 1) - 1} \\
&= \sqrt[3]{x^3} \\
&= x
\end{aligned}
$$

Any number can be plugged in for x at any point, so the domain is $(-\infty, \infty)$.