

Calculus I, Section 1.3, #46
New Functions from Old Functions

Express the function in the form $f \circ g$.¹

$$G(x) = \sqrt[3]{\frac{x}{x+1}}$$

Note that $\frac{x}{x+1}$ is “inside” the cube root.

So $g(x) = \frac{x}{x+1}$ and $f(x) = \sqrt[3]{x}$. Then

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

As we begin to learn the concepts and calculations of calculus, the ability to see how a function is composed from other functions is very important.

¹Stewart, *Calculus, Early Transcendentals*, p. 44, #36.