

Calculus I, Section 1.3, #50  
New Functions from Old Functions

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Express the function in the form  $f \circ g \circ h$ .<sup>1</sup>

$$H(x) = \sqrt[8]{2 + |x|}$$

Note that the absolute value function is part of (“inside”) the  $2 + \dots$  function, which is “inside” the eighth root function.

So  $h(x) = |x|$ ,  $g(x) = 2 + x$  and  $f(x) = \sqrt[8]{x}$ . Then

$$\begin{aligned} f \circ g \circ h &= f(g(h(x))) \\ &= f(g(|x|)) \\ &= f(2 + |x|) \\ &= \sqrt[8]{2 + |x|} \end{aligned}$$

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.

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<sup>1</sup>Stewart, *Calculus, Early Transcendentals*, p. 44, #50.