

8.3 Composite Functions Lesson

This document was composed and formatted by Annie Bernatchez.

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Two functions, f and g can be combined using a process called composition, which can be represented by:

$f(g(x))$ OR $(f \circ g)(x)$

This is read as “ f composite g ”

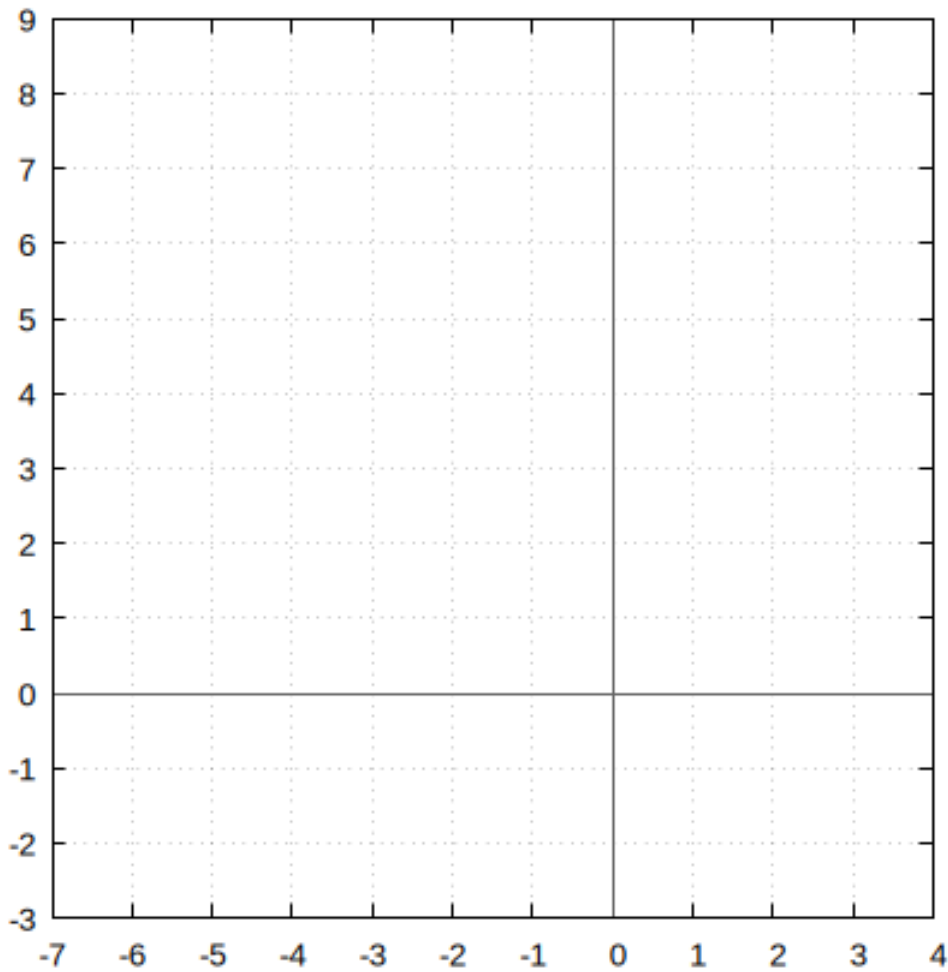
Part 1: Determine the Composition of Two Functions

To determine an equation for a composite function, substitute the second function into the first.

To determine $f(g(x))$, substitute $g(x)$ in for x into $f(x)$

Example 1: If $f(x) = x^2$ and $g(x) = x + 3$, determine an equation for each composite function and then graph the function.

a) $(f \circ g)(x)$	b) $(g \circ f)(x)$	c) $g^{-1}(g(x))$
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Part 2: Evaluate a Composite Function

To evaluate a composite function $f(g(x))$ at a specific value, evaluate $g(x)$ at the specific value and then substitute the result into $f(x)$.

Example 2: If $u(x) = x^2 + 3x + 2$ and $w(x) = \frac{1}{x - 1}$

a) Evaluate $(u \circ w)(2)$	b) Evaluate $w(u(-3))$
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Part 3: Application

Example 3: The number of rabbits, R , in a wildlife reserve as a function of time, t , in years can be modelled by the function $R(t) = 50 \cos(t) + 100$. The number of wolves, W , in the same reserve can be modelled by the function $W(t) = 0.2[R(t - 2)]$. Find the full equation for $W(t)$