Lesson 3 Composite Functions

Composite functions are functions that are formed from two functions, $f(x)$ and $g(x)$, in which the output of one of the functions is used as the input for the other function.

Notation: $(f \circ g)(x) = f(g(x))$

When combining functions, **order is important**:

$f(g(x))$ is not usually the same as $g(f(x))$

Examples

1. Given the following, determine

x	f(x)
-2	8
-1	3
0	0
1	-1
2	0

x	g(x)
-2	3
-1	2
0	1
1	0
2	-1

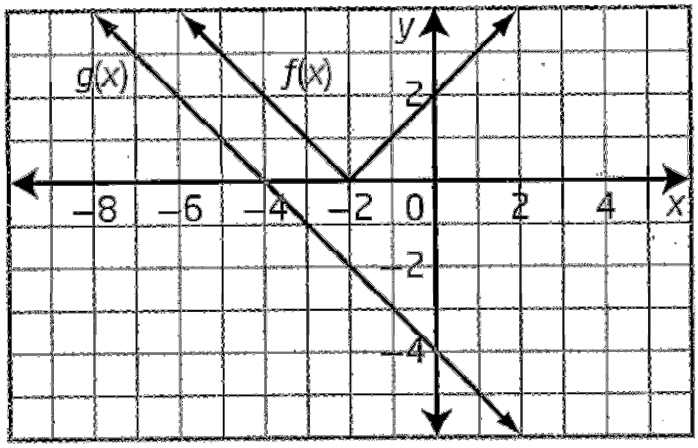
a) $f(g(2))$

b) $g(f(2))$

c) $g(g(2))$

2. Given the graphs of $f(x)$ and $g(x)$, determine

a) $f(g(-4))$



b) $f(f(-2))$

3. Given the functions $f(x) = x^2 + 3$ and $g(x) = -2x + 1$, determine

a) $f(g(2))$

b) $g(f(-3))$

c) $g(g(0))$

4. Given $f(x) = 2x^2 + 1$ and $g(x) = 2x + 7$, determine an explicit equation for each of the following:

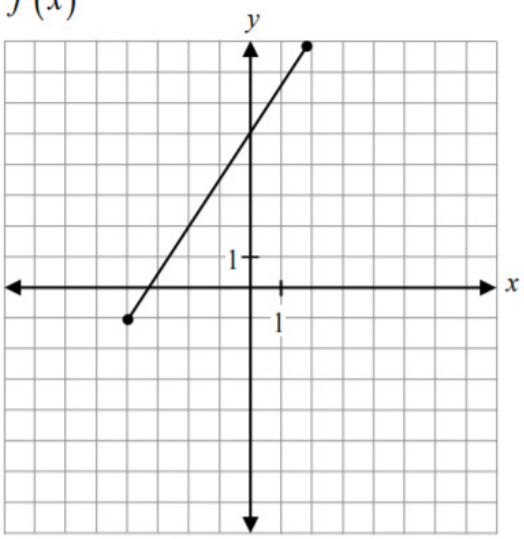
   a) $f(g(x))$

   b) $g(f(x))$

   c) $g(g(x))$

5. Given the graphs of $f(x)$ and $g(x)$, sketch the graph of $h(x) = g(f(x))$.

$f(x)$



$g(x)$