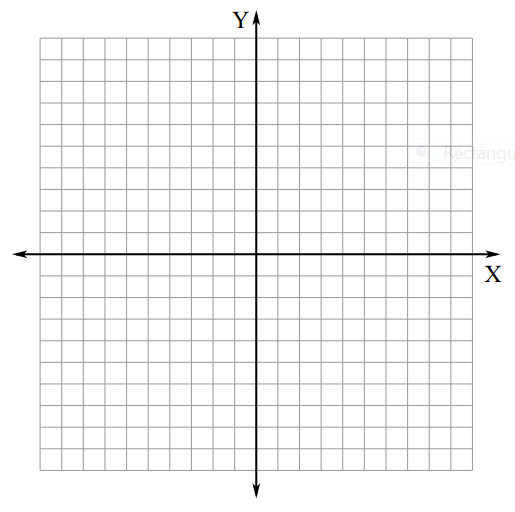
**Activity 1.5.1 Composing Composite Functions**

Suppose that we have two functions f(x) and g(x). The composite function (f g)(x) (also written as f(g(x)) is a function whose values are found by applying g to the independent variable x first, then applying the second function f to the value of g(x). In other words (and in color), to find (f g)(x), we first find the value of g(x), then find the value of f(g(x)).

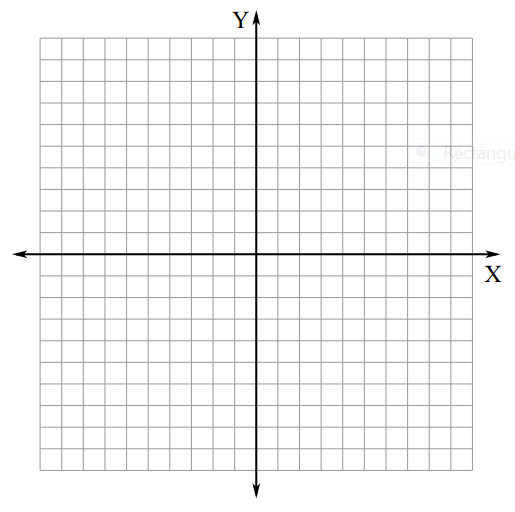
1. This problem explores the composition of two functions, and .

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| -3 | -9 | 9 |  |  |
| -2 | -7 | 4 |  |  |
| -1 | -5 | 1 |  |  |
| 0 | -3 | 0 |  |  |
| 1 | -1 | 1 |  |  |
| 2 | 1 | 4 |  |  |
| 3 | 3 | 9 |  |  |

1. Complete the fourth column by finding f g.
2. Sketch the graphs of f(x), g(x), and (f g)(x) on the same coordinate axes. Use an appropriate scale for the graph.



1. Can you tell what kind of a function f g is? Explain.
2. Complete the last column in the table above by finding g f.
3. Sketch the graphs of f(x), g(x), and g f on the same coordinate axes. Use an appropriate scale for your graphs.



1. Can you tell what kind of a function g f is?
2. Are f g and g f the same function? Are they the same type of function?
3. a) Given the graphs of f(x) and g(x) below, sketch the graph of (f g)(x) on the same coordinate plane. (Hint: Think about what happens when x = -3, x = -2, etc. For example, what is f(g(-3))? Consider making a table of values first.)



b) Can you tell what kind of function f g is? Explain.

3) Given f(x) and g(x) on the table below, fill in the remaining columns by finding f g, g f, f f, and g g. Are any of these functions the same for any values of x?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| -4 |  |  |  |  |  |  |
| -3 |  |  |  |  |  |  |
| -2 |  |  |  |  |  |  |
| -1 |  |  |  |  |  |  |
| 0 |  |  |  |  |  |  |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |