Check In: Graphing Composite Functions

Answer all questions in the spaces provided.

1. Given the following tables of values for $f(x)$ and $g(x)$:
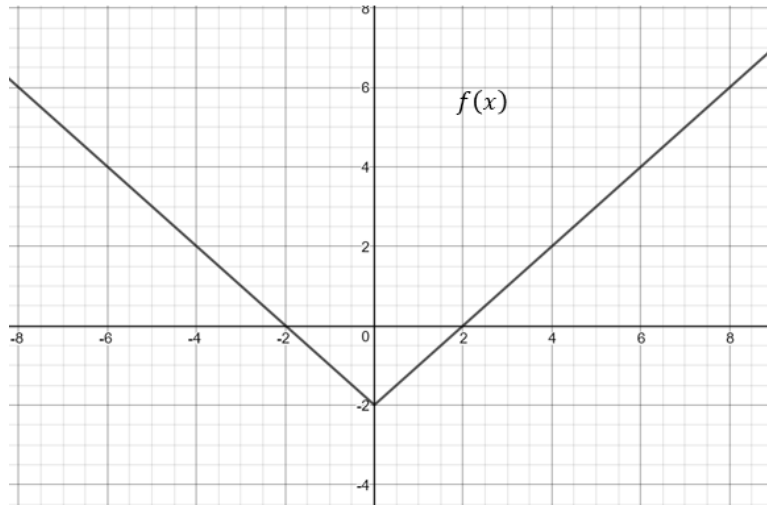
x	$f(x)$
-2	-3
0	1
2	4
4	7
6	10
8	14

x	$g(x)$
-3	10
0	8
1	4
4	0
7	-2
10	-6

Find:

a. $f\big(g(4)\big)$

b. $g\big(f(0)\big)$

c. $f\big(f(2)\big)$

d. $g\big(g(4)\big)$

2. Given the following functions for $f(x)$ and $g(x)$:

$$g(x) = x^2 - 6$$

Find:

a. $(f \circ g)(3)$

b. $(g \circ f)(1)$

c. $(f \circ f)(2)$

d. $(g \circ g)(x)$

3. If $p(x) = -4x + 5$ and $q(x) = 2x^2 - 6x$ find:

a. $p(q(x))$

b. $q(p(x))$

4. If $f(x) = \sqrt{x}$ and $g(x) = 4x - 3$, find each of the following. State the domain and range for each composite function.

a. $(f \circ g)(x)$

b. $(g \circ f)(x)$

5. If $f(x) = \frac{1}{x^2-4}$ and $g(x) = \frac{1}{x} + x$, find $g(f(x))$ and state its domain and range.

6. For each of the functions $f(x)$ and $h(x)$, find a function $g(x)$ such that $h(x) = f(g(x))$.

    a. $f(x) = x^3$ and $h(x) = (5x - 1)^3$

    b. $f(x) = 2^x$ and $h(x) = 2^{4(x-1)}$

    c. $f(x) = \sqrt{x}$ and $h(x) = \sqrt{sin(2x)}$

7. Graph $f(g(x))$ given that $f(x) = -3x^2 + 5$ and $g(x) = x - 2$. Show all key points.