Composition of functions NAME:

This worksheet will provide practice for composing two functions.

Remember that $(f \circ g)(x)$ is just a way to write $f(g(x))$ and that is interpreted as "the function *f* evaluated at the value *g*(*x*)".

This is similar to our interpretation of *f*(4), the function *f* evaluated at 4. Back when we were finding stuff like *f*(4), we simply plugged 4 in for the *x*'s into the *f*(*x*) formula and simplified.

We will do the same thing to find $f(g(x))$; we will plug whatever *g*(*x*) is in for the *x*'s into the *f*(*x*) formula and simplify.

1. Let $f(x) = -3x + 7$ and $g(x) = 2x^2 - 8$.

a.) Find and simplify $f(g(x))$.

b.) Find and simplify $(g \circ f)(x)$.

4. Let $f(x) = 2x - 5$ and $g(x) = .5(x + 5)$. Show that $f(g(x)) = x$ and $g(f(x)) = x$.

5. Let $f(x) = \dfrac{4x^2 + 5}{3}$ and $g(x) = -3x + 7$. Find the following.

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

b.) $f(g(2))$

c.) $f(g(-3))$

Function Composition Worksheet NAME _____

For problems 1–4, use $f(x) = 2x^2 - x$ and $g(x) = x + 6$ to find the indicated values.

1. $(f \circ g)(2)$
2. $(g \circ f)(2)$
3. $(f \circ g)(x)$
4. $(g \circ f)(x)$

For problems 5-8, use $f(x) = \dfrac{2x+1}{3x-2}$ and $g(x) = 5x - 1$ to find the indicated values.

5. $(f \circ g)(2)$
6. $(g \circ f)(2)$
7. $(f \circ g)(x)$
8. $(g \circ f)(x)$

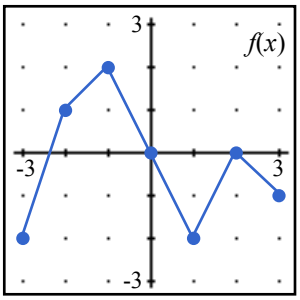
For problems 9–14, use the table definitions of $H(t)$ and $r(t)$ shown below to find the indicated value.

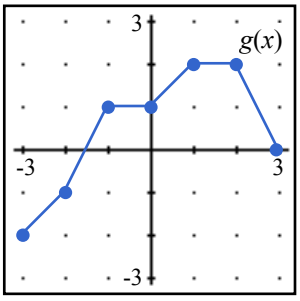
t	1.0	1.5	2.0	2.5	3.0	3.5
***H*(*t*)**	2.8	2.6	2.5	2.0	1.0	2.2

t	2.0	2.2	2.4	2.6	2.8	3.0
***r*(*t*)**	1.2	1.5	3.0	2.8	2.5	2.0

9. $(r \circ H)(2.5)$
10. $(r \circ H)(1.0)$
11. $(H \circ r)(2.2)$
12. $(H \circ r)(3.0)$
13. $(H \circ H)(2.0)$
14. $(r \circ r)(2.4)$

Problems 15-20 refer to the graphs of $f(x)$ and $g(x)$ shown. Find the indicated value.





15. $(f \circ g)(1)$
16. $(f \circ g)(-3)$
17. $(g \circ f)(1)$
18. $(g \circ f)(-1)$
19. $(f \circ f)(3)$
20. $(g \circ g)(0)$

Problem Set #5: Composition of Functions Worksheet

Let $f(x) = 2x - 1$, $g(x) = 3x$, and $h(x) = x^2 + 1$.

$f[g(x)] =$ $g[f(x)] =$

$f[h(x)] =$ $g[h(x)] =$

$f[g[h(x)]] =$

Compute the following:

1. $f[g(-3)]$
2. $f[h(7)]$
3. $g[h(-4)]$
4. $f[g(3)]$
5. $f[h(-7)]$
6. $g[h(5)]$
7. $g[f(9)]$
8. $g[f(0)]$
9. $g[f(-4)]$
10. $f[g[h(2)]]$
11. $f[g[h(-1)]]$
12. $f[g[h(-3)]]$