<center>10.3 Function Composition Part 2 Worksheet</center>

1. Given $f(x)$ and $g(x)$, write and simplify $f(g(x))$. State any restrictions on the variable.

a) $f(x) = \frac{1}{x}$ and $g(x) = -x$

b) $f(x) = \frac{1}{x+2}$ and $g(x) = 3 - x$

c) $f(x) = \frac{x}{x-2}$ and $g(x) = 2x$

2. Given $f(x)$ and $g(x)$, write and simplify $f(g(x))$. State the domain and range. Make a sketch of the new function to help you determine the domain and range.

a) $f(x) = \sqrt{x}$ and $g(x) = 3x$

b) $f(x) = \sqrt{x}$ and $g(x) = x - 2$

c) $f(x) = 2\sqrt{x} + 1$ and $g(x) = x - 2$

3. Given $f(x)$ and $g(x)$, write and simplify $f(g(x))$. State the domain and range. Make a sketch of the new function to help you determine the domain and range.

a) $f(x) = 2x - 1$ and $g(x) = \sin x$

b) $f(x) = \cos x$ and $g(x) = x - \frac{\pi}{4}$

c) $f(x) = 3x - 1$ and $g(x) = 2^x$

d) $f(x) = \log_2 x$ and $g(x) = x + 3$