Name: _____ Class: _____ Date: _____ ID: A

# Lesson #8 D: Understanding and Performing Compositions of Functions (Reference: Lesson #53 in book)

**Problem**

1. **Evaluate the composite function for each of the following, given the different functions.**

   1. $f(x) = -2x^2 + 4x + 3$ and $g(x) = x^2 - 2$, find $(f \circ g)(2)$ and $(g \circ f)(-2)$

2. If $f(x) = -3x^3 + 6x^2$ and $g(x) = \sqrt{-9 + x^2}$, find $f(g(-5))$ and $g(f(0))$.

3. If $f(x) = -3x^3 - 36x^2 + 1$ and $g(x) = -3x^2$ and $h(x) = \frac{\sqrt{-4x}}{2}$, find $(f \circ g \circ h)(-4)$.

4. **Find the composite function for each of the following, given the different functions.**

   4. Let $f(x) = -6x - 5$ and $g(x) = -4x - 7x^2$. Find the composite function $(g \circ f)(x)$ and $(f \circ g)(x)$.

5. Let $f(x) = -2x^2 - 12$ and $g(x) = 10x + 15x^2$. Find the composite function $(g \circ f)(x)$ and $(f \circ g)(x)$.

6. Let $f(x) = -\frac{1}{8}x^5 - 9$ and $g(x) = \sqrt[5]{-8x - 72}$. Find the composite function $f(g(x))$ and $g(f(x))$.

7. **Find the composite function for each of the following, given the different functions and find the domain of each of the resultant functions.**

   7. Let $f(x) = -2x^5 - 3x^4 + 4x^3$ and $g(x) = -3x^2$. Find the composite function $(g \circ f)(x)$ and $(f \circ g)(x)$.

8. Let $f(x) = \frac{3}{x^3}$ and $g(x) = \frac{9}{x^2}$. Find the composite function $f(g(x))$ and $g(f(x))$.

9. Let $f(x) = 2x + 3$ and $g(x) = \sqrt{x^4}$ and $h(x) = x^{\frac{3}{2}}$. Find the composite function $(g \circ h \circ f)(x)$ and $(f \circ g \circ h)(x)$.

10. Let $f(x) = \sqrt[3]{(6x - 2)^6}$ and $g(x) = \frac{1}{3}x^2 + 2$ and $h(x) = 3x^{\frac{1}{2}}$. Find the composite function $f(g(h(x)))$ and $h(f(g(x)))$.