# MATH 118: Quiz 5

Name: key

Directions:

- Show your thought process (commonly called "showing your work") when solving each problem for full credit.
- If you do not know how to solve a problem, try your best and/or explain in English what you would do.
- Good luck!

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1. Suppose

$$f(x) = -2x^2 - x \qquad g(x) = 2x + 3x^2 \qquad h(x) = 3x - 2 \qquad k(x) = 2 - 3x$$

Evaluate and simplify the following:

(a) $f(x) - 2g(x)$ $= -2x^2 - x - 2(2x + 3x^2)$

$= -2x^2 - x - 4x - 6x^2$

$= -8x^2 - 5x = \boxed{-x(8x+5)}$

(b) $h \circ f$

$(h \circ f)(x) = h(f(x)) = h(-2x^2 - x) = 3(-2x^2 - x) - 2$

$= \boxed{-6x^2 - 3x - 2}$

(c) $k \circ k$

$(k \circ k)(x) = k(k(x)) = k(2 - 3x) = 2 - 3(2 - 3x)$

$= 2 - 6 + 9x = \boxed{9x - 4}$

(d) $\dfrac{-h(x)}{k(x)}$

$= \dfrac{-(3x-2)}{2-3x} = \dfrac{-3x+2}{2-3x} = \dfrac{2-3x}{2-3x} = \boxed{1}$

2. Consider $g(x) = -2 - 3\sqrt{-2x+4}$. Identify each transformation and the order you would apply them in to transform the parent $f(x) = \sqrt{x}$ into $g(x)$.

$g(x) = -2 - 3\sqrt{-2x+4}$

$= -2 - 3\sqrt{-2(x-2)}$

(5) (1) (3) (2) (4) (6)

(1) reflection around x-axis

(2) reflection around y-axis

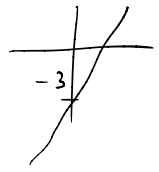
(3) v stretch by factor of 3

(4) h shrink by factor of $\frac{1}{2}$

(5) v shift down 2 units

(6) h shift right 2 units

3. Find the inverse of the function $f(x) = 2x - 5$, if possible.

(1) graph 

one-to-one ✓

(2) $y = 2x - 5$

(3) $y + 5 = 2x$

$x = \frac{y+5}{2}$

(4) $y = \frac{x+5}{2}$

$f^{-1}(x) = \frac{x+5}{2}$