Math 151 - Quiz 4

September 23, 2015

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (6 points) Let $f(x) = x^2 + x$ and $g(x) = 3x - 4$.

   (a) Evaluate $(f \circ g)(1)$.

   $= f(g(1))$

   $= f(-1) = \boxed{0}$

   $g(1) = 3(1) - 4 = -1$

   $f(-1) = (-1)^2 + (-1) = 0$

   (b) Evaluate $(g \circ f)(2)$.

   $= g(f(2))$

   $= g(6) = \boxed{14}$

   $f(2) = (2)^2 + 2 = 6$

   $g(6) = 3(6) - 4 = 14$

   (c) Find and simplify the formula for $(f \circ g)(x)$.

   $f(g(x)) = f(3x-4) = (3x-4)^2 + (3x-4)$

   $= 9x^2 - 24x + 16 + 3x - 4 = \boxed{9x^2 - 21x + 12}$

2. (2 points) Some values of the functions f and g are given in the table below. Evaluate $(f \circ g)(5)$.

x	1	2	3	4	5
$f(x)$	-2	11	8	0	1
$g(x)$	2	-9	4	-7	2

$f(g(5))$

$= f(2)$

$= \boxed{11}$

3. (2 points) Find functions f and g so that $(f \circ g)(x) = (2x - 5)^3 + 7$.

INSIDE: $g(x) = 2x - 5$

OUTSIDE: $f(x) = x^3 + 7$