Bellwork Alg 2B Wednesday, October 4, 2017

Use these two functions: $f(x) = 9x - 2x^2$ $g(x) = \frac{2x}{x-5}$

1. Find $f(g(3))$

2. Find $g(f(2))$

3. Find $f(f(f(1))$

4. Simplify each composite function as much as possible.

Given: $f(x) = 2x - 13$ $g(x) = x^2 + 3x - 7$

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

b) Find $(g \circ f)(x)$

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Use these two functions: $f(x) = 9x - 2x^2$ $g(x) = \frac{2x}{x-5}$

1. Find $f(g(3))$ = -45

1st $g(3) = \frac{2(3)}{3-5} = \frac{6}{-2} = -3$

2nd $f(-3) = 9(-3) - 2(-3)^2$
$= 9(-3) - 2(9)$
$= -27 - 18$
$= -45$

2. Find $g(f(2))$ = 4

1st $f(2)$ $9(2) - 2(2)^2 = 9(2) - 2(4)$
$= 18 - 8$
$= 10$

2nd $g(10) = \frac{2(10)}{10-5} = \frac{20}{5} = 4$

3. Find $f(f(f(1)))$ = -2765

1st $f(1) = 9(1) - 2(1)^2 = 9(1) - 2(1) = 9 - 2 = 7$

2nd $f(7) = 9(7) - 2(7)^2 = 9(7) - 2(49) = 63 - 98 = -35$

3rd $f(-35) = 9(-35) - 2(-35)^2 = 9(-35) - 2(1225) = -315 - 2450$
$= -2765$

4. Simplify each composite function as much as possible.

Given: $f(x) = 2x - 13$ $g(x) = x^2 + 3x - 7$

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

$= 2(g(x)) - 13$

$= 2(x^2 + 3x - 7) - 13$

$= 2x^2 + 6x - 14 - 13$

$= 2x^2 + 6x - 27$

b) Find $(g \circ f)(x)$

$g(f(x)) = g(2x - 13)$

$= (2x-13)^2 + 3(2x-13) - 7$

$= 4x^2 - 52x + 169 + 6x - 39 - 7$

$= 4x^2 - 46x + 123$