Name: _____ Date: _____ Period: _____

Compositions of Functions HOMEWORK

Directions: Answer the following questions in the space provided. Show your work on questions that require work and show substitutions. Simplify your answers.

Suppose $f(x) = 3 - 5x;$ $g(x) = x^2 - 4x;$ $h(x) = 2(x + 3)^2$	
1) Find $g(f(x))$	**2)** Find $f(g(x))$
3) Find $h(f(1))$	**4)** Evaluate $g(h(-2))$

Use the table below to determine the value of each composite.

$f(x) = x^2 - 15$		$g(x) = \sqrt{x}$		5) Find $(f \circ g)(36)$
x	$f(x)$	x	$g(x)$	
1	-14	1	1	
2	-11	4	2	
3	-6	9	3	**6)** Find $(f \circ f)(4)$
4	1	16	4	
5	10	25	5	
6	21	36	6	
7	34	49	7	

Use the graph below to determine the value of each composite.

7) Find $g(h(0))$

8) Find $f(g(4))$

9) The number N of bacteria in refrigerated food is given by

$$N(T) = 20T^2 - 80T + 500$$
Where T is the temperature of food in degrees Celsius and $2 \le T \le 14$.

When the food is removed from refrigeration, the temperature of the food is given by

$$T(t) = 4t + 2$$
Where t is the time in hours and $0 \le t \le 3$.

a) Find the composition $N(T(t))$.

b) Explain the meaning of $N(T(t))$ in context.

10) The number N of cars produced at a certain factory in one day after t hours of operation is given by $N(t) = 100t - 5t^2$. If the cost C (in dollars of producing N cars is $C(N) = 15000 + 8000N$,

a) find the cost C as a function of the time t of operation of the factory.

b) If the domain is $0 \le t \le 10$, what is the cost at the end of the factory day?