Name: _____ Date: _____ Period: _____

_____ **Compositions of Functions (continued)**

Composition of Functions is just another operation like adding, subtracting, multiplying and dividing.

Please note the notations for adding, subtracting, multiplying and dividing functions:

Operation	Add	Subtract	Multiply	Divide
What to Do	Combine the like terms of the expressions together.	Distribute the minus to every term in the second function; then combine like terms.	Distribute or FOIL based on the number of terms multiplying. Simplify.	Write a fraction with the two expressions.
Notations	$f+g$	$f-g$	gf	$\frac{g}{f}$
	$(f+g)(x)$	$(f-g)(x)$	$(g \cdot f)(x)$	$\left(\frac{g}{f}\right)(x) or (g \div f)(x)$
	$f(x)+g(x)$	$f(x)-g(x)$	$g(x) \cdot f(x)$	$\frac{g(x)}{f(x)}$

The notation for compositions are f(g(x)) or (f ∘ g)(x). Notice how the circle is <u>open</u> between the two function letters.

1) Suppose $f(x) = 3x - 5$, $g(x) = x^2$, $h(x) = 4x^3 + 7$

a) Find $f(g(2))$

b) Find $(g \circ h)(1)$

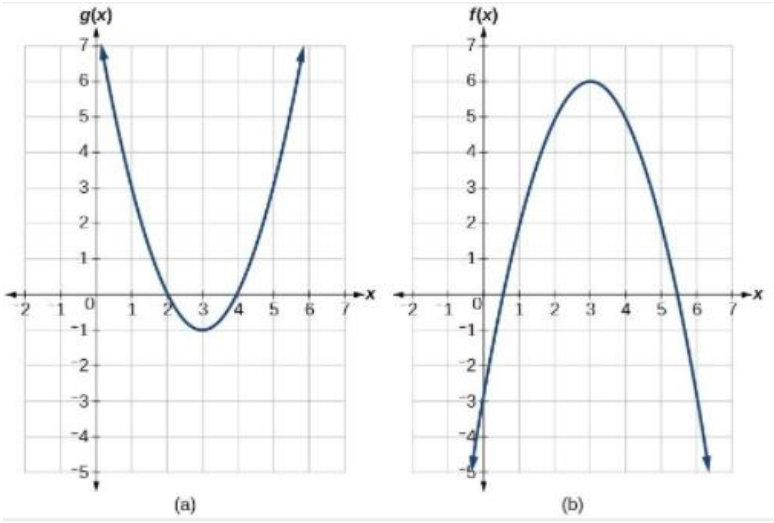
2) Suppose you are given the table below.

x	f(x)	g(x)
1	6	3
2	8	5
3	3	2
4	1	7

a) Find $f\big(g(1)\big)$

b) Find $(g \circ f)(3)$

3) Suppose you are given the graphs on the right. Find $f(g(1))$.



4)

Suppose $f(x) = 2x + 3$ and $g(x) = -4x^2 + 12$ and $h(x) = x^2 + 5x$. Find the compositions.

a) $f(g(x))$

b) $g(f(x))$

c) $(h \circ f)(x)$

5) The price p, in dollars of a certain product and the quantity x sold follow the demand equation

$$p = -\frac{1}{4}x + 100 \quad 0 \leq x \leq 400$$

Suppose that the cost C, in dollars, of producing x units is

$$C = \frac{\sqrt{x}}{25} + 600$$

Assuming that all items produced are sold, find the cost C as a function of the price p.

[Hint: solve for x in the demand equation then form the composite function]