Name: _____ Date: 09/22/14
Pre-Calculus Ms. Wilson

Unit 1: Functions and Graphs
Homework Packet #3 – Due 9/29/14

For questions 1-2, find formulas for *f+g*, *f – g*, *fg*, and *f/g*. Write the domain and range of each combined new function.

1.) $f(x) = 2x - 1; g(x) = x^2$

f+g:

f-g:

fg:

f/g:

2.) $f(x) = (x-1)^2; g(x) = 3 - x$

f+g:

f-g:

fg:

f/g:

For questions 3-6, find values for $(f(g(3))$ and $g(f(-2))$:

3.) $f(x) = 2x - 3; g(x) = x + 1$

4.) $f(x): x^2 - 1; g(x) = 2x - 3$

5.) $f(x) = x^2 + 4; g(x) = \sqrt{x+1}$

6.) $f(x) = \frac{x}{x+1}; g(x) = 9 - x^2$

For questions 7-10, find *f(g(x)) and g(f(x))*. State the domain of each composed function.

7.) $f(x) = 3x + 2; g(x) = x - 1$

8.) $f(x) = x^2 - 1; g(x) = \frac{1}{x-1}$

9.) $f(x) = x^3; g(x) = \sqrt[3]{1 - x^3}$

10.) $f(x) = \frac{1}{2x}; g(x) = \frac{1}{3x}$

For questions 11-12, find *f(x)* and *g(x)* so that the function can be described as *y=f(g(x))*. (There may be more than one possible decomposition. BONUS: See how many you can find!)

11.) $y = \sqrt{x^2 - 5x}$

12.) $y = (tanx)^2 + 1$

13.) Jake stores a small cache of 4-inch diameter snowballs in the basement freezer, unaware that the freezer's self-defrosting feature will cause each snowball to lose about 1 cubic inch of volume every 40 days. He remembers them about a year later (let's say 360 days) and goes to retrieve them. What is their diameter when he takes them out of the freezer?

14.) A satellite camera takes a rectangular shaped picture. The smallest region that can be photographed is a 5-km by 7-km rectangles. As the camera zooms out, the length l and the width w of the rectangle increase at a rate of 2 km/sec. How long does it take for the area A to be at least 5 times its original size?