Problems PreCal 1508 PLTL Workshop September 7, 2011
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1. Write the equation of the function $p(x)$ shifted up by k units and to the left by h units.

2. Write down the definition for a function with domain A and range B. And give a real life example of a function (without numbers)

3. Determine $(f+g)(x)$, $(f \cdot g)(x)$, $(\frac{f}{g})(x)$, and $(f \circ g)(x)$ and determine the domain of the resulting function, for the following functions

   (a) $g(x) = x^2 + 3, \quad f(x) = x^3 + 9$
   (b) $g(x) = 3x^2 + 1, \quad f(x) = \sqrt{1-x}$
   (c) $g(y) = \sqrt{y^2 - 4}, \quad f(x) = \frac{x^2}{x^2+1}$
   (d) $f(s) = \frac{1}{s}, \quad g(y) = \frac{1}{y^2}$
   (e) $f(r) = \frac{r}{r+1}, \quad g(q) = q^3$

4. Show that the product of two odd functions is an even function, and that the product of two even functions is an even function

5. Find two different pairs of functions f and g such that $(f \circ g)(x) = h(x)$. There are many correct answers.

   (a) $h(x) = (2x+1)^2$
   (b) $h(x) = \frac{-x^2+3}{4-x^2}$
   (c) $h(x) = \frac{4}{(5x+2)^2}$
   (d) $h(x) = \sqrt[3]{9-x}$

6. Consider $f(x) = x^2$ and $g(x) = \sqrt{x}$. Find $f \circ g$ and $g \circ f$, and their domains.

7. Find $(f \circ f)(x)$ and the implied domain of $f \circ f$ if $f(x) = \sqrt{-x}$

8. Graph $f(x) = -|-x+2| + 1$

9. Expand $(x+2)^3 + (x-2)^3$