Math 105 Quiz 1
§1.1-§1.4
Name: Key
Show all work for credit.

1. Give the domain and range of the following functions (Hint: They should not be the same):

   (a) $f(x) = x$

   D: $(-\infty, \infty)$, all reals
   R: $(-\infty, \infty)$, all reals

   (b) $g(x) = (\sqrt{x})^2$

   Note $\sqrt{x}$ requires $x \geq 0$
   D: $[0, \infty)$, $x \geq 0$
   R: $[0, \infty)$, $y \geq 0$

   (c) $h(x) = \frac{x^2}{x}$

   Note division by x means $x \neq 0$
   D: $(-\infty, 0) \cup (0, \infty)$, all reals except 0
   R: $(-\infty, 0) \cup (0, \infty)$, all reals except 0

2. The graph of j can be found from the graph of k if you:

   (a) Shift k left 2 units then $k(x+2)$
   (b) Flip over the x-axis then $-k(x+2)$
   (c) Shift down by 3 units. $-k(x+2)-3$

   Write the function $j(x)$ based on $k(x)$. i.e. $j(x) = 2k(x-5)-1$ (this is NOT the answer, but here to give you an example).

   $j(x) = -k(x+2)-3$

3. What is the working definition of f', the derivative of some function f?

   f' is the function of instantaneous rate of change of f
   $f'(a)$: slope of the tangent line ~~through~~ on f $(a, f(a))$
   $f'(a)$: slope at $(a, f(a))$ on f