Assignment #1 **Name** _____

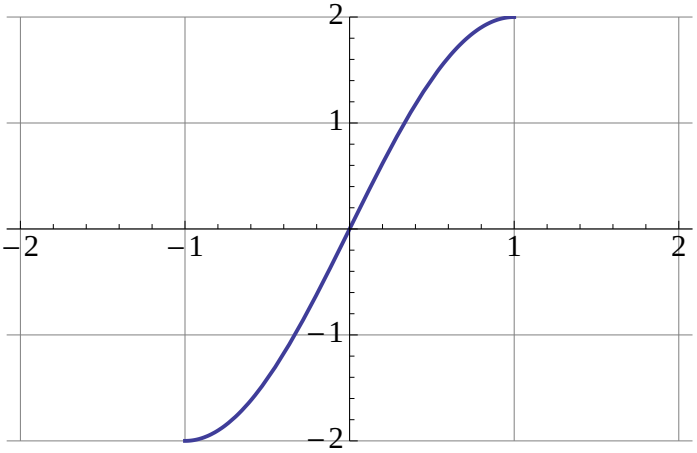
Due 16 January 2015

1. Let $f(x) = x^2 + 5$.
   (a) Show that $f(x)$ is one-to-one on the restricted domain $D = [0, \infty)$.

   (b) What is the range of f on the set D?

   (c) Let f^{-1} denote the inverse of f on the set D. Find an algebraic formula for $f^{-1}(x)$. What are the domain and range of f^{-1}.

2. The graph of a function $y = f(x)$ is pictured below. Graph $y = f^{-1}(x)$ on the same axes.



3. Let f be a one-to-one and invertible function whose graph contains the point $P(1,3)$. If the tangent line to the curve $y = f(x)$ at P is given by the equation $y = \frac{1}{2}x + \frac{5}{2}$, then find $(f^{-1})'(3)$.

4. Let $f(x) = x^5 + x^3 + 2x$.
   (a) Show that f is invertible and find $f^{-1}(-4)$.

   (b) Evaluate $(f^{-1})'(-4)$.