Local Linearization

1. Consider $f(x) = 1/x$.

   (a) Find the local linearization (aka tangent line approximation) to $f(x)$ at $x = 1$.

   (b) Use your approximation to estimate $f(1.1)$.

   (c) Make a very rough sketch $f(x)$ near $x = 1$.

   (d) Is your estimate too high or too low? Use a graph of $f(x)$ to support your reasoning.

2. Let $g(x) = \sin(x)$. Find the local linearization of $g(x)$ at $x = 0$.