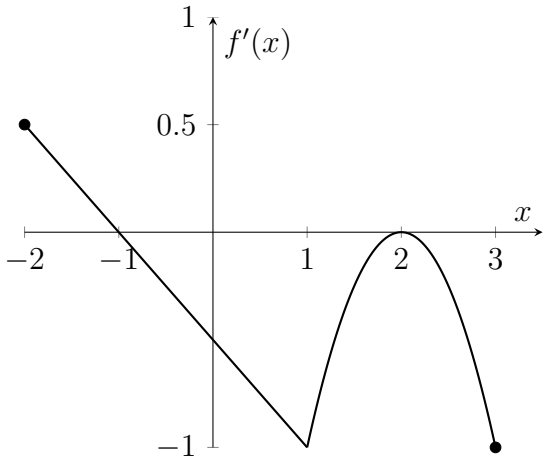
Math 122B020F14 Quiz 5 October 23, 2014 Name: _____

1. Consider the graph of $y = f'(x)$ given below:



For the following two questions, you must provide a sign chart to justify your answers.

(a) Find and classify ('local min', 'local max' or 'neither') all critical points of $f(x)$ on the interval $[-2, 3]$

(b) Find the x coordinate of any inflection points of $f(x)$ on $[-2, 3]$.

2. Compute the derivative of $h(z) = \ln(\cosh(1 + z^2))$ and simplify your answer.

3. In economics, one studies the effect of price p (in \$) on sales Q.

(a) Suppose that for some good, $Q'(100) = -10$. Which of the following is a *good* practical interpretation of this?

— If the price increases from \$10 to \$11, about 100 fewer items will be sold.

— If the price is about \$100, about 10 items are sold.

— The rate of change of Q is -10.

— If the price increases from \$100 to \$101, about 10 fewer items will be sold.

(b) Suppose that $Q'(100) = -10$ and $Q(100) = 500$. Find a linear function $L(x)$ which approximates $Q(p)$ near $p = 100$.

(c) Use your answer from part (b) to approximate $Q(105)$.

(d) If $Q''(p) > 0$ for all p, is your answer in part (c) and underestimate or overestimate? Why?