Homework 2
Due Friday 2/4/2011 in class

Name: **Section Number:**

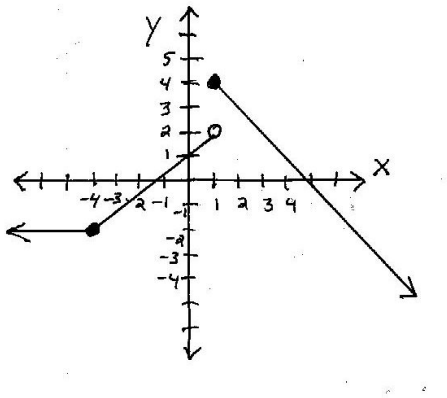
This cover sheet must be attached as the top page of your homework.

1. Sketch the graph of f . Determine whether f^{-1} exists. Find and sketch a graph of its inverse if it exists.

   (a) $f(x) = \cos x$, on $[0, \pi]$
   (b) $f(x) = x^2$, for all x
   (c) $f(x) = x^2$, for $x \leq 0$

2. Simplify the following expression: $\cos 2(\sin^{-1} x + \cos^{-1})$

3. Given the function $f(x)$ defined by the following graph:



   (a) Evaluate the following limits if they exist:
   $\lim_{x\to -4} f(x)$, $\lim_{x\to 1^-} f(x)$, $\lim_{x\to 1^+} f(x)$, $\lim_{x\to 1} f(x)$.
   (b) Is $f(x)$ continuous at the point $x = -4$? Explain why or why not.
   (c) Is $f(x)$ continuous at the point $x = 1$? Explain why or why not.
   (d) Is $f(x)$ continuous on the interval $(-4, 1)$? Explain why or why not.
   (e) Is $f(x)$ continuous on the interval $[-4, 1]$? Explain why or why not.

4. Evaluate the limit:

$$\lim_{x\to 0} \frac{x^2 \cos 2x}{1 - \cos x}.$$

5. Prove using the formal definition of the limit (epsilon-delta definition) that

$$\lim_{x\to 3}(4x - 2) = 10.$$