Due Date: Oct. 07, 2015 (in class)   Name: _____

Section: **007**

- There are two problems in this assignment. Each problem can earn you a maximum of 10 points.
- **Attach extra sheets if necessary.**

Problem 1. State whether the following statements are true or false, and give a brief argument for your answer.

(a) Let $f(x)$ be a continuous function on $[-1, 1]$, and $f(-\frac{1}{2}) = 2$, $f(0) = 0$ and $f(\frac{1}{2}) = 1$. Then, f is invertible on $[-1, 1]$.

(b) If $\lim_{x \to 0} f(x) = 1$, then $\lim_{x \to 0} |f(x)| = 1$.

(c) If $\lim_{x \to 0} |f(x)| = 1$, then $\lim_{x \to 0} f(x) = 1$.

(d) The function $f(x) = \log_3(1 - \sin(x))$ is discontinuous at exactly four points.

Problem 2. Without using the concept of derivatives or any graphing device, compute the following limit:
$$\lim_{x\to\infty} x^2 \cos(\tan^{-1}(4x^2)).$$

(Hint: Using the concepts covered in section 1.5, try to get rid of the trigonometric functions in the above expression.)