

**Quiz**  
**September 12, 2007**

**Problem 1.** Find the limit

$$\lim_{x \rightarrow \infty} \left( 1 + \frac{1}{x^2} \right)$$

Just write down the limit, no explanations or proofs required.

**Problem 2.** Find the limit

$$\lim_{x \rightarrow 0} \frac{\sin(7x)}{\sin(3x)}$$

Prove your claim, that is show that your answer is really the limit. You do not have to use the " $\epsilon$ - $\delta$  definition".

**Problem 3.** Using the " $\epsilon$ - $\delta$  definition" show that

$$\lim_{x \rightarrow 1} (x^2 + 3x) = 4.$$