Part I (due at the beginning of class Thursday, September 10)

1. Consider this variation of question 5 on the Functions and Limits handout: You're trying to guess $\lim_{x\to 0} f(x)$. You plug in $x = 0.1, 0.01, 0.001, \ldots$ and get $f(x) = 0$ for all these values. Then you plug in $x = -0.1, -0.01, -0.001, \ldots$ and get $f(x) = 0$ for all these values as well. In fact, you're told that for all $n = 1, 2, \ldots$, the value $f\left(\pm\frac{1}{10^n}\right) = 0$.

   True or **False**: Since the sequences $f(0.1), f(0.01), f(0.001), \ldots$ and $f(-0.1), f(-0.01), f(-0.001), \ldots$ both go to 0, we know $\lim_{x\to 0} f(x) = 0$.

2. Also consider questions 13 and 14 on the Functions and Limits handout.

Part II: Problems (due at the beginning of class Tuesday, September 15)

1. Use the Squeeze Theorem to find $\lim_{x\to 3}\left((x^2-9)\sin\frac{1}{x^2-9}\right)$. Make sure to carefully explain your solution, showing how you're applying the Squeeze Theorem.

2. If $\lim_{x\to 1^-} f(x) = 5$ and $\lim_{x\to 1^+} f(x) = 5$, what, if anything, can you say about $\lim_{x\to 1} f(x)$? What, if anything, can you say about $f(1)$? Explain your answers.