Name: _____________________________________________

Please show all work and box the answers.

1. (30 pts.) Solve the following inequalities for \( x \) and express the answer in interval notation.
   
   (a) \( \frac{1}{x + 1} \geq 1 \)  \hspace{1cm} (b) \( x^2 - 1 \leq 0 \)  \hspace{1cm} (c) \( |x - 1| \geq 1 \)

2. (10 pts.) Find the largest \( \delta > 0 \) such that \( |x - 1| < \delta \Rightarrow |2x - 2| < 0.1 \).

3. (40 pts.) In each case find the specified limit or state that it does not exist and briefly explain why.
   
   (a) \( \lim_{x \to 1} \frac{x^3 - 1}{x - 1} \)  \hspace{1cm} (b) \( \lim_{x \to 0} \frac{|x|}{x} \)  \hspace{1cm} (c) \( \lim_{x \to 1} \frac{\sin(x - 1)}{x^3 - 1} \)  \hspace{1cm} (d) \( \lim_{x \to 1} \frac{x}{\sin x} \)

4. (32 pts.) Sketch the following functions
   
   (a) \( f(x) = \frac{x - 1}{x + 1} \)  \hspace{1cm} (b) \( f(x) = x^2 - 1 \)  \hspace{1cm} (c) \( f(x) = |x^2 - 1| \)  \hspace{1cm} (d) \( f(x) = \frac{|x^2 - 1|}{x - 1} \)