

MAT 170 Section 005

August 26, 2005

Names _____

Please work in groups with no more than four people and complete this worksheet during class. Hand in one worksheet for each group.

1. Consider the limit

$$\lim_{x \rightarrow 1} \frac{\tan\left(\frac{\pi x}{4}\right) - 1}{\pi(x - 1)}.$$

With the help of a calculator, estimate the value of the limit to 5 decimal places at $x = 1.1, 1.01, 1.001$ and 1.0001 . Put your solution in the form of a table.

Based on these numbers, make a guess of what the value of the limit should be.

2. Let

$$f(x) = \frac{x^2 - 1}{x^3 - 1}.$$

Either make a table as in problem 1), or draw a graph of the function to estimate the value of the limit

$$\lim_{x \rightarrow 1} f(x).$$

Show your work.

3. Let

$$f(x) = \frac{|x - 4|}{x - 4}.$$

Either make a table as in problem 1), or draw a graph of the function to estimate the values of the limits

$$\lim_{x \rightarrow 4^+} f(x) \quad \text{and} \quad \lim_{x \rightarrow 4^-} f(x).$$

Show your work.

4. Let

$$f(x) = \sin\left(\frac{1}{x}\right).$$

Either make a table as in problem 1), or draw a graph of the function to estimate the value of the limit

$$\lim_{x \rightarrow 0^+} f(x).$$

Show your work.