Midterm 1 / 2001.10.10 / Calculus I / MAT 1214.002

Name: _____

Please show all work and justify your answers.

1. (20 pts.) Evaluate each of the following limits or state that the limit does not exist.

   (a) $\lim_{x \to -3} \dfrac{x^3 + 27}{x^2 - 9}$

   (b) $\lim_{x \to -1^+} \dfrac{|1 + x|}{1 + x}$

   (c) $\lim_{t \to 0} \dfrac{\tan(2t)\cos(t^2)}{\sin(3t)}$

   (d) $\lim_{t \to 0} t\cos(1/t)$

2. (20 pts.) Find the derivatives of the following functions

   (a) $f(x) = \sqrt{x}$

   (b) $f(x) = \dfrac{1}{\sqrt{3x^3}}$

   (c) $f(x) = \dfrac{3x + 1}{2x^3 - 5}$

   (d) $f(x) = 2x^3\cos(x)$

3. (15 pts.) Find the equation of line tangent to the graph of $y = \cos x$ at $x = -\pi/3$. Sketch both the curve and the tangent line on one properly labeled graph.

4. (10 pts.) State the definition of derivative and use it (without resorting to rules of differentiation) to find $f'(4)$, where $f(x) = \sqrt{x}$.

1	2	3	4	total (65)	(%)