Math 150 Quiz 3 Fall 2012

Name: Key Section time: _____

NO CALCULATORS

1. [10 points] Find the following limits. Show each step used. No credit for just plugging in numbers.

(a) $\lim_{x\to 0} x\cot 3x$

$= \lim_{x\to 0} \frac{x\cos 3x}{\sin 3x}$

$= \frac{1}{3}\lim_{x\to 0} \frac{3x}{\sin 3x}\cos 3x$

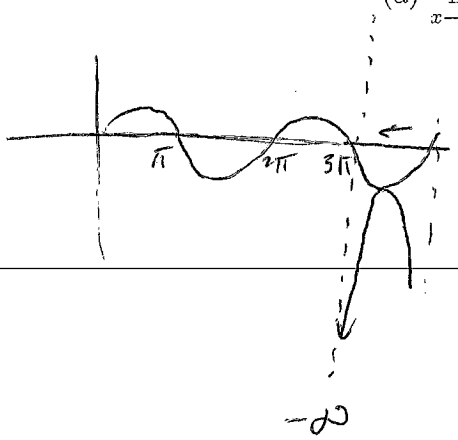
$= \frac{1}{3}\cdot 1\cdot 1 = \frac{1}{3}$

(b) $\lim_{x\to 1} \frac{1-\sqrt{x}}{1-x}$ $\quad \frac{1+\sqrt{x}}{1+\sqrt{x}} = \frac{1-x}{(-x)(1+\sqrt{x})}$

$= \lim_{x\to 1} \frac{1}{1+\sqrt{x}} = \frac{1}{1+\sqrt{1}} = \frac{1}{2}.$

2. [10 points] Find the following limits. Justify your answers by discribing briefly the behavor if the trig functions.

(a) $\lim_{x\to 3\pi^+} \csc x = -\infty$



$-\infty$

(b) $\lim_{x\to -\frac{\pi}{2}^-} \tan 2x$

$\tan\left(2\left(-\frac{\pi}{2}\right)\right) = \tan(-\pi) = -\tan(\pi) = 0.$