MATH 141 (Section 5 & 6)
Prof. Meade

Quiz 9
October 30, 2013

University of South Carolina
Fall 2013

Name: __Key__
Section: 005 / 006 (circle one)

1. (6 points) Find the limit. Indicate each time l'Hôpital's Rule is applied.

(a) $\displaystyle\lim_{x\to 1}\frac{1-x+\ln(x)}{1+\cos(\pi x)}$ $\overset{l'H}{\underset{\frac{0}{0}}{=}}$ $\displaystyle\lim_{x\to 1}\frac{-1+\frac{1}{x}}{-\pi\sin(\pi x)}$ $\overset{l'H}{\underset{\frac{0}{0}}{=}}$ $\displaystyle\lim_{x\to 1}\frac{-x^{-2}}{-\pi^2\cos(\pi x)}$

$\ln(1)=0$
$\cos(\pi)=-1$

$-1+1=0$
$\sin(\pi)=0$

$= \dfrac{-(1^{-2})}{-\pi^2\cos(\pi)} = \dfrac{1}{\pi^2}$

(b) $\displaystyle\lim_{x\to 0}\frac{x}{\arctan(4x)}$ $\overset{l'H}{\underset{\frac{0}{0}}{=}}$ $\displaystyle\lim_{x\to 0}\frac{1}{\frac{4}{1+(4x)^2}}$

$\arctan(0)=0$

$= \dfrac{1}{\frac{4}{1+0^2}} = \dfrac{1}{4}$

(c) $\displaystyle\lim_{x\to\infty} x\cos\left(\frac{\pi}{x}\right) = \infty\cdot 1 = \infty.$

$\cos(0)=1$

not an indeterminate form!

2. (4 points) List the eight specific Guidelines that we use to draw a sketch of the graph of a function that shows the most important aspects of the function.

A. Domain
B. Intercepts.
C. Symmetry
D. Asymptotes

E. Intervals of Increasing/Decreasing
F. Local Max/Min.
G. Concavity & Inflection Pts.
H. Sketch the graph.