Math 1A (9:30am – 10:20am)
Quiz 3
Fri Jan 23, 2009

SCORE: ___ / 20 POINTS

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your social security number ? ___ ___
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

NO CALCULATORS ALLOWED

State the Intermediate Value Theorem. **SCORE: ___ / 2 POINTS**

IF f IS CONTINUOUS ON $[a,b]$
AND d IS BETWEEN $f(a)$ AND $f(b)$
THEN THERE EXISTS c IN (a,b)
SUCH THAT $f(c)=d$

$\frac{1}{2}$ POINT EACH

Evaluate the following limits. Give your answers as ∞, $-\infty$, a number or DNE. **SCORE: ___ / 12 POINTS**
The answer should be DNE ***only if the other answers do not apply***.
Show supporting work and/or give a ***brief*** explanation. You may use the shorthand notation shown in lecture.

[a] $\lim_{x\to 3^+} \frac{1-x}{\sqrt{x^2-9}} = -\infty$ 1

$\frac{-2}{0^+}$ 1

[b] $\lim_{x\to 1} \frac{x-2}{(x-1)^3}$ DNE 1

$\lim_{x\to 1^+} \frac{x-2}{(x-1)^3} = -\infty$ $\frac{-1}{0^+}$ 1

$\lim_{x\to 1^-} \frac{x-2}{(x-1)^3} = +\infty$ $\frac{-1}{0^-}$ 1

[c] $\lim_{x\to 2^+} \frac{x^2-5}{(x+2)^2} = \frac{-1}{16}$ 2

[d] $\lim_{x\to -\infty} (x^3 - 5x^4 - 2x^5) = +\infty$ 1

DEGREE ODD 1

LEADING COEFFICIENT NEGATIVE 1

Find all horizontal asymptotes of $f(x) = \frac{1-2x^2}{(x+1)^2}$. **SCORE: ___ / 4 POINTS**

Show supporting work as demonstrated in lecture. DO NOT USE PRECALCULUS SHORTCUTS.

1 $\lim_{x\to\pm\infty} \frac{1-2x^2}{(x+1)^2}$

$= \lim_{x\to\pm\infty} \frac{1-2x^2}{x^2+2x+1} \cdot \frac{\frac{1}{x^2}}{\frac{1}{x^2}}$

$= \lim_{x\to\pm\infty} \frac{\frac{1}{x^2}-2}{1+\frac{2}{x}+\frac{1}{x^2}} = \frac{0-2}{1+0+0} = -2$ 1

H.A. $y=-2$ 1

[MULTIPLE CHOICE] Find $\lim_{x\to \frac{\pi}{2}^-} e^{-\tan x}$. $\lim_{x\to \frac{\pi}{2}^+} e^{-\tan x} = \infty$ **SCORE: ___ / 2 POINTS**

[a] $-\infty$ [b] ∞ [c] 1 [d] 0

LETTER OF CORRECT ANSWER: [ ]

$\lim_{x\to \frac{\pi}{2}^-} e^{-\tan x} = 0$