

Pledge:

2/3/2009
Dr. Lunsford

MATH261 Calculus I
Quiz 3

Name: _____
(30 Points Total)

I. Basic limits. Find the exact value of the following limits (i.e. not a calculator approximation). You are not required to show an intermediate step for these problems. (2 points each – no partial credit, 8 points total)

1. $\lim_{t \rightarrow \infty} 10^7 t^3 - 11 t^4 + 10^6 t^2$

2. $\lim_{x \rightarrow 1^+} \frac{x-2}{x-1}$

3. $\lim_{x \rightarrow \infty} \frac{3x - 4x^3}{6 + 2x^3}$

4. $\lim_{x \rightarrow -\infty} \frac{x-1}{x^3 + 7}$

II. More interesting limits. Find the exact value of the following limits (i.e. not a calculator approximation). For each limit you must show at least one intermediate step for full credit. (5 points each, 10 points total)

1. $\lim_{w \rightarrow 4^-} \frac{-8 + 6w - w^2}{w^2 - 8w + 16}$

2. $\lim_{x \rightarrow -\infty} \frac{4x + 7}{\sqrt{9x^2 + x} - 4}$

III. Let $f(x) = \begin{cases} \frac{1}{x+2} & , x < -2 \\ x & , -2 \leq x < 2 \\ \frac{x^2}{2} & , 2 \leq x \end{cases}$. Please answer the following questions using this function. (4

points each, 12 total)

(a) Is f continuous at $x = 2$? You must show all work to justify your answer.

(b) Is $x = -2$ a vertical asymptote of the function? Again show all work to justify your answer.

(c) Does f have a horizontal asymptote? Why or why not? Please show all work to justify your answer.