Math 124 Worksheet #2

April 13, 2007

1. For what values is $\ln(\tan^2 x) + 2x^5$ continuous?

2. For what value of c is the function below continuous at $x = 0$?

$$f(x) = \begin{cases} c\, e^{x^2-x}, & \text{if } x \leq 0 \\ 2x^2 + 1 + 2c, & \text{if } x > 0 \end{cases}$$

3. Evaluate the following limits.

   (a) $\lim\limits_{x\to-\infty} \dfrac{x+1}{3x^5-2x+5}$

   (b) $\lim\limits_{x\to\infty} \dfrac{\sqrt{9x^2+x+1}}{2x-5}$

4. Estimate $\lim\limits_{x\to\infty}(1 + \dfrac{1}{x})^x$ with a table of values (to 4 decimal places). Does this value look familiar?

5. Find the horizontal and vertical asymptotes of the curve $y = \dfrac{3x^5-1}{x^2+5x+6}$.