MATH141(0332) Calculus II

Quiz 4, Thursday, October 2, 2008   Name: _____

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Calculator is not allowed in this quiz. You have 15 minutes to take this 12 point quiz. You can earn at most 10 points in this quiz. The extra points will not count.

1. (*3 points*) Solve the following integral.

$$\int_1^2 \frac{1}{x^2 - 2x + 4} dx$$

(Some information might be useful: $tan(\pi/6) = \sqrt{3}/3, tan(\pi/4) = 1, tan(\pi/3) = \sqrt{3}$)

2. (*2 points*) Find $\lim\limits_{x \to 0} \frac{cos(x)}{x+1}$.

3. (*3 points*) Find $\lim\limits_{x \to +\infty} \frac{x^{10}}{e^{5x}}$. Please write down the solution in detail.

4. (*4 points*) Find the value of the following limits using either strategy given below.

$$\lim\limits_{x \to +\infty} \frac{x}{\sqrt{x^2 + 1}}.$$

(1) Use L'Hopital rule once, and find the relationship between the result and the original function.
(2) Use substitusion $x = tan\theta$ and solve the problem.