

# MATH141(0332) Calculus II

Quiz 7, Thursday, October 23, 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 10 point quiz.

- 1.** (4 points) (1) Write down the approximation of  $\int_a^b f(x)dx$  using Simpson's rule, when  $n = 4$ .  
(2) Set  $f(x) = x^3$ ,  $a = 0$ ,  $b = 1$ . Approximate  $\int_0^1 x^3 dx$  using the formula generated in (1).  
(3) Check if the approximation value is the same as the exact value. Explain why.  
Hint: Use the error approximation formula

$$E_n^S \leq \frac{(b-a)^5}{180n^4} \max_{x \in [a,b]} |f^{(4)}(x)|$$

- 2.** (2 points) Determine whether the following integral converges or diverges.

$$\int_0^1 \frac{1}{x(x+1)} dx.$$

- 3.** (4 points) Solve the improper integral

$$\int_0^2 \frac{1}{(x-1)^{\frac{2}{3}}} dx$$