Test 3
Spring 2007
MATH 122 Section 01
March 26, 2007

Directions : You have 50 minutes to complete 4 of the 5 problems on this exam. Below please list the four (and only four) problems that you would like for me to grade. There are a possible 100 points to be earned. Please be sure to show all pertinent work. *An correct answer with no work will receive little credit!* If any portion of the exam is unclear please come to me and I will elaborate provided I can do so without giving away the problem.

Please list the four problems you wish graded here.

_____   _____   _____   _____

1. Evaluate the integrals:

a) $\int \dfrac{dx}{\sqrt{x^2 + 16}}$

b) $\int_0^{2/3} x^3 \sqrt{4 - 9x^2}\,dx$

2. Write out the form of the partial fraction decomposition of the function.
   Do not determine the numerical value of the coefficients.

   a) $\dfrac{2x}{(x+3)(3x+1)}$

   b) $\dfrac{1}{x^3 + 2x^2 + x}$

3. Evaluate the integral:

$$\int \frac{5x^2 + 3x - 2}{x^3 + 2x^2} dx$$

4. Find the approximations T_6 and S_6 for $\int_0^1 e^x dx$ and the corresponding errors E_T and E_S. How large do we have to choose n so that the approximations T_n, M_n, and S_n to the integral $\int_0^1 e^x dx$ are accurate to within 0.00001?

5. Evaluate the integral:
$$\int \frac{\sqrt{x^2 - 9}}{x^3} \, dx$$
[Just FYI $\sin 2\theta = 2 \sin \theta \cos \theta$.]