Math 236 Spring 2001 Name: _____

Quiz 5 (3/1) Circle one: 03/05

You have 20 minutes to take this quiz. Each problem will be graded for clarity of work as well as correctness, so show all work **clearly and in order**. Circle or otherwise indicate your final answers. Please note that there are problems on both the front and the back of this page.

YOU MAY USE CALCULATORS ON THIS QUIZ, WITH THE USUAL RESTRICTIONS.

All of the problems on this quiz are taken directly from the homework.

1. (*6 points*) Calculate the integral $\int \frac{x^2}{(1-x^2)^{\frac{3}{2}}}\, dx$.

Turn over for more...

2. (*6 points*) Use the fact at the bottom of the page to find the values of n for which a theoretical error less than 0.005 can be guaranteed if the integral below is estimated using the trapezoidal rule. Show your calculations so that it is clear how you arrived at your answer.

$$\int_1^3 e^x \, dx$$

DO NOT SOLVE OR APPROXIMATE THIS INTEGRAL.
JUST ANSWER THE QUESTION ABOVE.

Error bound for trapezoidal approximations

Let E_n^{T} be the theoretical error for approximating the integral $\int_a^b f(x)\,dx$ by the trapezoidal rule using n trapezoids.

Then $|E_n^{\mathrm{T}}| \le \dfrac{(b-a)^3}{12n^2}\, M$,

where M is some number with $|f''(x)| \le M$ for all $a \le x \le b$.