MATH 162: Calculus II, Sections B/C

Information for Exam 1

to take place on Feb. 14, 2007

General Instructions. You will be allowed to use calculators on this exam. Please note, however, that because some calculators are endowed with the ability to carry out symbolic manipulation (and, as a result, can find antiderivatives for a wide variety of user-defined functions), a rather strict policy for showing work will be followed. In particular, any assertion that requires so big a jump your teacher is unsure it is true (or doubts that most students at this level could show it to be true) will be considered a significant gap in your work, and result in a reduction of points, perhaps even in a score of zero for the problem. For instance,

$$\int \frac{dx}{2x-3} = \frac{1}{2}\ln|2x-3| + C, \qquad \text{and} \qquad \int \frac{1}{2}\sin(x/3) = -\frac{3}{2}\cos(x/3) + C,$$

are acceptable without intermediate steps to elaborate on these equalities. However,

$$\frac{1}{x(x+1)} = \frac{1}{x} - \frac{1}{x+1},$$

is too big of a jump without accompanying work.

Formulas/identities. The following are formulas which, should they be needed for some problem on the exam, will be provided.

$$\begin{aligned}
\sin(2\theta) &= 2\sin\theta\cos\theta \\
\sin(m\theta)\sin(n\theta) &= \frac{1}{2}[\cos((m-n)\theta) - \cos((m+n)\theta)] \\
\sin(m\theta)\cos(n\theta) &= \frac{1}{2}[\sin((m-n)\theta) + \sin((m+n)\theta)] \\
\cos(m\theta)\cos(n\theta) &= \frac{1}{2}[\cos((m-n)\theta) + \cos((m+n)\theta)] \\
|E_{T_n}| &\le \frac{M(b-a)^3}{12n^2}, \quad \text{where} \quad |f''(x)| \le M \quad \text{for} \quad a \le x \le b \\
|E_{S_n}| &\le \frac{M(b-a)^5}{180n^4}, \quad \text{where} \quad |f^{(4)}(x)| \le M \quad \text{for} \quad a \le x \le b
\end{aligned}$$

All other formulas (that come to mind) which we have used in this chapter should be known (not stored in your calculators!) by you. A list of such formulas includes, but is not limited to, the following:

$$\begin{aligned}
\sin^2\theta + \cos^2\theta &= 1 \\
1 + \tan^2\theta &= \sec^2\theta \\
1 + \cot^2\theta &= \csc^2\theta \\
\sin^2\theta &= \frac{1}{2}[1 - \cos(2\theta)] \\
\cos^2\theta &= \frac{1}{2}[1 + \cos(2\theta)] \\
2\sin^2\theta &= 1 - \cos(2\theta) \\
2\cos^2\theta &= 1 + \cos(2\theta) \\
\tan\theta &= \frac{\sin\theta}{\cos\theta} \\
\cot\theta &= \frac{\cos\theta}{\sin\theta} \\
\sec\theta &= \frac{1}{\cos\theta} \\
\csc\theta &= \frac{1}{\sin\theta} \\
T_n &= \frac{\Delta x}{2}[f(x_0) + 2f(x_1) + 2f(x+2) + \cdots + 2f(x_{n-1}) + f(x_n)] \\
S_n &= \frac{\Delta x}{3}[f(x_0) + 4f(x_1) + 2f(x_2) + 4f(x_3) + 2f(x_4) + \cdots + 2f(x_{n-2}) + 4f(x_{n-1}) + f(x_n)]
\end{aligned}$$

If you have doubts that I meant for you to commit a certain fact to memory, assume the answer is yes unless you ask and receive a different answer.