Math 31b : Midterm 2, Spring 2011

Professor Antieau

Each problem is worth 10 points.

1. Find the limits of the following sequences (and justify your answers carefully):
(a) $a_n = (\sin n)/\sqrt{n}$;
(b) $b_n = n \sin(1/n)$.

2. Compute, using the method for surface area of a solid of revolution, the surface area of a sphere of radius R.

3. Compute the indefinite integral

$$\int \frac{x+7}{x^2(x+2)}\, dx.$$

4. Find an interval $[a, b]$ containing 0 such that if x is in $[a, b]$, the error of the 5th Taylor polynomial for $f(x) = e^x$ (with $a = 0$) is less than or equal to 10^{-18}.

5. Compute the value of $\ln 2$ to an error of at most 10^{-3}. You should use Taylor polynomials, but you do not have to actually simplify the final approximation $T_n(2)$.