Problem Set 2
Applied Mathematics I, MA 531
Due October 20, 2010

Do the following problems from the text, *Advanced Engineering Mathematics*, 2nd edition, by M. Greenberg.

Section 3.2: 2b,e, 3e   Section 4.2: 2a,b, 3a,c
Section 3.4: 4e,g,l, 6b,e   Section 4.3: 1a,b, 2, 6a,e
Section 3.5: 8, 10b,c   Section 4.4: 3, 5
Section 3.6: 1e, 7a   Section 4.5: 10a, 14
Section 3.7: 2j,k, 4d   Section 4.6: 5, 8b,c
Section 3.8: 10

In addition, answer the following question.

1. Show that the set of functions $\{e^{rx}, xe^{rx}, x^2 e^{rx}, \ldots, x^n e^{rx}\}$ is linearly independent for any fixed $n \in \mathbb{N}$ and $r \in \mathbb{R}$.
(Hint: The Wronskian will be very messy, so instead start by considering a linear combination of the terms involved in order to simplify the problem.)