18.034 PROBLEM SET 9

Due April 28 in class. No lates will be accepted. Discussion is encouraged, with two caveats: (a) write up your solutions by yourself, and (b) give credit when others came up with ideas (you won't be penalized for this). Give explanations, not just answers. References are to Boyce and DiPrima; the answers to problems from the book are in the back of the book.

1. *Nonhomogeneous systems.* (a) Problem 7.9.1, p. 411. (b) Problem 7.9.4.
2. *Power series.* (a) Problem 5.1.6, p. 231. (b) Problem 5.1.7. (c) Problem 5.1.9. (d) Problem 5.1.18.
3. (a) Problem 5.2.3, p. 241. (b) Problem 5.2.21.
4. *Chebyshev polynomials.* (a) Problem 5.3.10, p. 247. (b) Notice that $\cos 0x = 1$, $\sin 1x = \sin x$, $\cos 2x = 1 - 2\sin^2 x$, $\sin 3x = 3\sin x - 4\sin^3 x$. Compare this to your answer to 5.3.10 (c). What do you conjecture?
5. Problem 5.3.20, p. 248. (It will help to first solve the equation the old-fashioned way.)
6. *Legendre polynomials.* (a) Problem 5.3.22. (b) Problem 5.3.23.
7. *Legendre polynomials cont'd.* (a) Problem 5.3.28, p. 249. (b) Problem 5.3.29.

Date: April 21, 2000.