

Homework 6

Due October 27

Before writing your solutions commit yourself to being correct and clear throughout your arguments. In order to receive any credit the grader must be able to follow your arguments.

This is an individual assignment. While you may discuss the problems with your colleagues, you will write up your own individual solutions.

1. (15 points) Problem 1 page 95.
2. (20 points) Use the *pdsolve* command in Maple to find the general solution to the nonlinear PDE $u_t + 3u_x = u^3$. Find the solution which satisfies the IC $u(x, 0) = -3e^{-x}$. In the same plot display the solution surface $u(x, t)$ **and** the curve for the function $-3e^{-x}$ (use a different color or width to plot the curve so it can be easily identified). You should see the curve supported on the surface.
3. (10 points) Problem 1 page 98.
4. (15 points) Problem 1 page 105.
5. (10 points) Problem 5 page 106.
6. (10 points) Problem 1 page 111.
7. (10 points) Problem 4 page 112.
8. (10 points) If the final exam was tomorrow ... List 3 problems that you would like see included on the exam and 3 problems that you would not feel comfortable solving during the final.