

Math4090 Assignment 8

Due 11:30am, Mar. 24, 2010

Use the method of characteristics to solve the following initial value problems:

1. $\rho_t + 2\rho_x = 0$, $\rho_0(x) = e^{-x^2}$;
2. $\rho_t + 2t\rho_x = 0$, $\rho_0(x) = e^{-x^2}$;
3. $\rho_t + j_x = 0$, $j = 2\rho - \rho^2$, $\rho_0(x) = 1$ for $x \leq 0$ and $\rho_0(x) = 0$ for $x > 0$;
4. $\rho_t + j_x = 0$, $j = 2\rho - \rho^2$, $\rho_0(x) = 0$ for $x \leq 0$ and $\rho_0(x) = 1$ for $x > 0$.