Practice Midterm 1

Math 3435, Spring 2019, UConn

Date: 02/27/2019, Wednesday
Duration: 1h

Instructions:

- No calculator is allowed.
- Unless it is indicated in the questions that only a final answer is required, you need to show your work to get credit.
- If you have work on the back of a page, please indicate this on the front of the page.

Name: _____

Husky Card ID: _____

Question	Points	Score
1	10	
2	10	
3	10	
4	10	
Total	40	

Question 1. Solve $u_x + u_y + u = e^{x+2y}$ with $u(x, 0) = 0$ by the method of characteristic curves.

Question 2. Solve $u_{xx} - 3u_{xt} - 4u_{tt} = 0$, $u(x,0) = x^2$, $u_t(x,0) = e^x$.

Question 3. Prove uniqueness of the solution to the wave equation $u_{tt} - c^2 u_{xx} = 0$ satisfying the initial conditions $u(x,0) = \phi(x) \in C^2$, $u_t(x,0) = \psi(x) \in C^1$.

Question 4. Provide a solution to the heat equation $u_t - ku_{xx} = 0$ satisfying the initial condition $u(x, 0) = \phi(x)$ where $\phi(x) = 1$ for $x > 0$ and $\phi(x) = 3$ for $x < 0$.