Instructions: Each of the six problems is worth 13 points. To put your name in the designated box is worth 2 points. Only responses entered in the allocated space for each problem will be graded. Present only the complete solution including all explanation (without scratch work, use the back of the assignment sheet for that purpose) neatly. You must support all of your answers in order to receive credit. Do not remove the staples. Do not turn in the assignment sheet. Grades will be posted on the web tomorrow.

1. Find the general solution of $3u_x + 2u_t = 0$.
2. Separate the variables in $u_x - u_y + 2u_z = 0$.
3. Find the solution of $2u_x + 3u_t = 4u + x$ that satisfies $u(x, 0) = 9x^2$.
4. Find the solution of $tu_x + xu_t = 0$ that satisfies $u(0, t) = e^{-t^2}$.
5. Determine the types of the wave equation, heat equation, and Laplace equation.
6. Transform the equation $u_{xx} + 2u_{xt} + u_{tt} = 2u$ into standard form. Solve the obtained standard PDE. Then use the transformation to obtain the solution of the original PDE.