

Suggested problems. Set 2.

- Section 2.1: 4, 5, 7.

- Determine the characteristic curves to the equation

$$x^2 u_{xx} - 2x u_{xy} + \frac{3}{4} u_{yy} + \frac{1}{2} u_y = 0.$$

Transform the equation to a normal form in all of \mathbb{R}^2 . Find the general solution.

- Determine the characteristic curves to the equation

$$u_{xx} - 9x^4 u_{xy} - 6xu = 0.$$

Transform the equation to a normal form in the domain $x > 0$.

- Section 3.1: 1, 3, 4, 6, 7, 8.

- Solve the equation

$$u_{xx} - u_{tt} = 0$$

in the domain $t > 0$ and $x > 0$ with the initial/boundary conditions

$$u(x, 0) = x^2, \quad u_t(x, 0) = 0, \quad u(0, t) = 0.$$