

MATH 462 Section 0201 Fall 2019  
**PARTIAL DIFFERENTIAL EQUATIONS**

**HOMEWORK # 2** (due Th Sep 12)

1 (30 pts). Given the initial value problem

$$2u_t + x(1+t)u_x = u^2, \quad u(x, 0) = x.$$

- (a) Find the characteristics  $x = x(t)$ ;
- (b) Find the solution  $u(x, t)$ ;
- (c) Verify that the function  $u(x, t)$  in (b) is a solution of the initial value problem.

2 (30 pts). Problem 10 in §1.2 of Strauss.

3 (20 pts). Problem 1 in §1.3 of Strauss.

4 (20 pts). Problem 2 in §1.3 of Strauss.