

MTH 621/Peszynska/Fall 2011, Assignment 2

Please show all your work. Use proper mathematical notation.

1. [ pts] Solve  $u_t + u_x + u_y = 0$  with the initial condition  $u(x, y, 0) = g(x, y)$  where  $g$  is a smooth function.
2. [ pts] Solve  $u_t + au_x = 0$  with the initial condition  $u(x, 0) = f(x), x > 0$  and  $u(0, t) = g(t), t > 0$ . What would you require from  $f(\cdot)$  and  $g(\cdot)$  in order to have the classical solution ?
3. [ pts] Solve problems 2-6.4ab from textbook.
4. [ pts] Solve 2-6.5b from the book.
5. [ pts] Solve 4-1.1 (Extra: solve also 4-1.2) from the book