Math 241, Fall 2015 **Renato Ghini Bettiol**

Homework Set 10

DUE: DEC 1, 2015 (IN CLASS)

1. Use Fourier transforms to solve $3u_x + 5u_t = 0$, with initial condition $u(x,0) = f(x)$.

2. Use Fourier transforms to solve $3t\,u_x + 5u_t = 0$, with initial condition $u(x,0) = f(x)$.

3. Use Fourier transforms to solve $u_t + u_x + u = 0$, with initial condition $u(x,0) = f(x)$.

4. Use Fourier transforms to find an explicit formula for the solution $u(x,t)$ of

$$\begin{cases} u_t = 2u_{xx}, \\ u(x,0) = \sin(3\pi x) \end{cases}$$

   where $-\infty < x < \infty$, $t > 0$.

5. Use Fourier transforms to find a formula for the solution $u(x,t)$ of

$$\begin{cases} u_t = k\,u_{xx} + u, \\ u(x,0) = f(x) \end{cases}$$

   where $-\infty < x < \infty$, $t > 0$, in terms of $f(x)$ and k.

6. Haberman 10.5.11 (HINT: Use the table in p. 470)

7. Haberman 10.6.2 (a), (b)