Math 4362 Homework #2

1. 2.2.3 (a)

2. 2.2.4

3. 2.2.8

4. 2.2.12

5. 2.2.11. Hint: Show that the characteristic curves are the lines $x(t) = t + \xi$. Let $h(t) = u(t, x(t))$. Derive an ODE IVP for the function h and solve it.

6. 2.2.20, but instead of part (c) let $u(0, x) = f(x) = e^{-x^2}$ and sketch the solution at $t = \pi/8$ and $t = \pi/4$ by using the fact that the solution is constant along characteristic curves.