

# HW8

May 28, 2009

1. Solve  $u_t + u_x = 0$  at  $t = 2, 4, 6, 8$ ,  $-1 < x < 1$  and draw the solution.  
(a) periodic boundary conditions, with initial data:

$$u(x, 0) = \sin(\pi x)$$

- (b)  $u(1, t) = -1$  and  $u(-1, t) = 1$  with initial data:

$$u(x, 0) = \begin{cases} -1 & \text{for } x \geq 0 \\ 1 & \text{for } x < 0 \end{cases}$$

by the following schemes:

- (i) 2nd order TVD with superbee limiter (16.14) & (16.27)
- (ii) 2nd order TVD with van Leer limiter (16.14) & (16.28)
- (iii) 2nd order TVD with minmon slope (16.46) & (16.51)