Exercise 2

Weak solutions of Burgers' equation

Due Sunday, Sept. 9 in class

Consider Burgers' equation

$$q_t + \left(\frac{1}{2}q^2\right)_x = 0$$

with initial condition $q(x,0) = 0$. Clearly $q(x,t) = 0$ is a weak solution.

Show that

$$q(x,t) = \begin{cases} 0 & x < -ct \\ -2c & -ct < x < 0 \\ 2c & 0 < x < ct \\ 0 & ct < x \end{cases}$$

is also a weak solution.