

Damped Burgers' equation
Due Monday, Feb. 18th in class

Consider the damped Burgers equation

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

Does this equation admit shocks? Determine necessary and sufficient conditions (depending on the initial data $q(x, 0)$) for shock formation to occur.

Hint: solve the problem by characteristics and determine whether they will cross.