ASSIGNMENT 4
ECON 6501: URBAN AND REGIONAL ECONOMICS

Due **Thursday, 28 May, 6:00pm**. Students are welcome to discuss homework in groups, but each student must prepare and submit a unique assignment. Note the names of other group members. All assignments must be neat and professional. Answer all parts of all questions, or include a copy of your midterm exam as a substitute for questions that received full credit.

1. Consider a monocentric city model where residents all work at $x = 0$. A fixed number of residents, H, live in the city. The boundary between residential and agriculture land is governed by a green belt law, which outlaws resident living more than B distance from the city center. Residents can buy land (q) for the location dependent rate $p(x)$ and purchase nonland consumption (c) for price 1. Residents pay a monetary commuting tx, so at location x the consumer's budget constraint is $pq + c + tx = y$. (The income level y is sufficiently large that non-negativity constraints are not binding.) Residents have identical preferences given by

$$u(c, q) = c \cdot q - \beta B.$$

   (a) Find the price of land, p, as a function of x, H, and B.

   (b) Find the utility level residents can attain as a function of B.

   (c) Find the green belt distance B that would maximize the welfare of residents.