Theory of Industrial Structure
ECO-4371
Fall, 2009.
Problem Set 4
Due: November 5, Thursday, in class.
(Solutions will be discussed in class on Nov 5 and therefore, assignment cannot
be turned in late).

1. Do exercise 12.4 in the textbook.

2. Consider the linear city model of horizontal product differentiation. The
product space is given by an interval of length one - the interval \([0, 1]\). Consumers’
most preferred product is located on the interval \([0, 1]\) and distributed
uniformly on the interval. If a consumer buys from a firm whose product is
located at a distance \(d\) from the consumer’s most preferred product, then she
incurs a psychological (transport) cost of \(20d\) (in addition to paying the price
charged by the firm). There are two firms in the market. Each firm sells one
product located somewhere on the interval. Production takes place at constant
unit cost equal to 10 for both firms. Assume that all consumers buy in equilib-
rium.

(i) Suppose that both firms’ products are located at the same point on the
interval. What are the equilibrium prices charged by the two
firms?

(ii) Suppose that the two firms’ products are maximally differentiated i.e.,
located at the two ends of the interval. Derive the equilibrium prices.

(iii) Compare the market power and profits of the firms in (i) and (ii).

(iv) What would the market outcome be in (ii) if consumers had no infor-
mation about the type of product sold by either firm (i.e., their location on the
space) and, in particular, thought that each firm’s product could be located at
either 0 or 1 with equal likelihood? What does this suggest about the effect of
advertising product information on intensity of price competition and market
power?

(v) What would be the product positioning by the firms (i.e., their choice
of product location on the line) if they both commit to charging a perfectly
collusive (joint profit maximizing) price? Use your answer to comment on the
effect of collusion on degree of product differentiation.

(Hint: only part (ii) requires mathematical derivation. The other parts can
be answered using logic.)

3. Do exercise 12.7 (b),(c) and (d) in the textbook.