

ECON 224, Prof. Hogendorn

Problem Set 4

1. *Boatshoes*. Suppose that there are four main brands of boat shoes: Sperry Top-Sider, Sebago, Frye, and Eastland. Suppose each brand has yearly operating profits of \$150 million, and each brand is initially owned by a separate company. All other shoe companies that make boat shoes currently sell too few to have much impact on the market. Each firm has exactly 25% of the market.
 - (a) What is the CR2, CR4, and HHI of this industry?
 - (b) Let the fixed costs of running a major boat shoe brand be \$130 million per year, and assume 4 is the free-entry equilibrium number of firms in this industry. Draw a graph of operating profits as a function of the number of firms. Also draw the line showing fixed costs. Show the points on the operating profit function that represent 3, 4, and 5 firms in the industry.

2. *FirstSolar*. Suppose the solar panel industry consists of a group of identical firms that all have horizontal marginal cost MC_1 .
 - (a) Draw a market diagram for solar panels with downward sloping demand and the flat marginal cost. Show what price a single firm would charge, and what price firms would charge under perfect competition.
 - (b) Show what prices a 2-firm oligopoly (duopoly) and a 3-firm oligopoly might charge. Exactly what prices would depend on the type of equilibrium that emerges, but can you assume lower prices as the number of firms increases. Also

show the 1-firm, 2-firm, and 3-firm outcomes on a separate graph of operating profit as a function of number of firms.

- (c) Now suppose the firm First Solar develops a new technology that allows it to produce at a lower marginal cost MC_2 . No one else can produce at MC_2 . What would be First Solar's optimal profit-maximizing price assuming that it takes over the entire market? Show its operating profit on the diagram. Does it set $MR = MC$, and why or why not?