1) Assume that there are five wheat farmers in a perfectly competitive market who are located on a rail line which runs to a grain mill. Assume that the competitive market price is high enough to just cover the production and transportation costs of farmer number 5, who is located the farthest from the mill. Farmer 1 is located at the mill. Assume also that each farmer has the same marginal cost of production.
   a. Which farmer earns no rents?
   b. Which farmer earns the greatest rents?

2) First-degree price discrimination: Complete a diagram indicating first-degree price discrimination. I have drawn the demand curve and MC.
   a. Indicate the MR curve and the total amount sold.
   b. Label the area of dead-weight loss as DWL and consumer surplus as CS. If these are zero, say so.
   c. If I am running a restaurant, can I use this type of price discrimination to price discriminate among customers? ______.
   d. Why or why not? ______.
3) Third-degree price discrimination:

   a. Finish the following diagram illustrating third-degree price discrimination with constant marginal cost. I have drawn in $D_1$, $D_2$, and $MC$. Draw in $MR_1$ and $MR_2$. Label $P_1$, $Q_1$, $P_2$, and $Q_2$. What is true about the price elasticity of demand in the market where price is higher? ___________. Give an example of this type of pricing. ___________.

   b. Label the areas of welfare loss if any in each market as $WL_1$ and $WL_2$. 
4) Game theory. Consider the following game of the dominant and submissive pig, where numbers represent the payoffs.

a. Use one underline to represent the optimal strategy for person 1 and use two underlines to represent the optimal strategy for person 2 under non-cooperation?

b. Circle all Nash equilibria. How do you recognize a Nash equilibrium in terms of underlines? 

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5) Second degree price discrimination. In the following diagram, there are two 2-part tariffs. For the first, the entry fee is \( T_1 = 0 \) and the marginal price is \( m_1 \). For the second, the entry fee is \( T_2 \) and the marginal price is 0.

a. If I consume \( X_1 \), which tariff will I choose? _______________. Why?

b. If I consume \( X_2 \), which tariff will I choose? _______________. Why?

c. With a wavy line, indicate the only relevant part of these two lines.

d. Give one specific example of a firm which offers this kind of two 2-part tariffs.______________

e. Why does the monopolist prefer to use two 2-part tariffs rather than a single price for all units? ________________.

f. Can I successfully employ a two-part tariff where the entry fee and marginal cost for group 1 is larger than the entry fee and marginal cost for group 2? ________________. Why or why not? ________________.

g. An optimal two-part tariff for the firm would have the price per unit set to ________________ and the entry fee set to ________________ for each group.
6. Different types of price discrimination:

a. What type of price discrimination (first, second, or third) most closely describes that used by the Japanese company which installs a Coke machine that raises the price of Coke as temperature rises and lowers the price as temperature falls? _____________. Why with regard to WTP? _____________.

b. Kroger’s offers discounts for holders of a Kroger’s card and no discount to others. What type of price discrimination is this? _____________. How are prices set with regard to elasticities? _____________.

c. Nordstrom’s offered 40% off for early-bird shoppers the day after Thanksgiving. What type of price discrimination is this? _____________. How are prices set with regard to elasticities? _____________.

d. Barnes and Nobles offers membership in their Book Club for a $25 annual fee. This entitles you to 20% off on each book purchased. The alternative is to just pay full price for whatever you buy. What kind of price discrimination is this? _____________. How are prices set with regard to WTP? _____________.

e. An airline charges different prices for two adjacent seats in coach. What type of price discrimination is this? _____________. How are prices set with regard to elasticities? _____________.

f. The local Peking restaurant offers “all you can eat” or a la carte pricing. What kind of price discrimination is this? _____________. How are prices set with regard to WTP? _____________.

g. Do we typically enforce the Clayton Act which prohibits price discrimination? Why? _____________.

h. Define Price Discrimination, carefully listing the 4 elements:

1.

2.

3.

4.