

## Practice Questions

I. True or false, and why:

1. Because it contributes to global warming, there is currently no equilibrium in the market for petroleum.
2. There are many unsold seats on airplanes; this demonstrates that there is no equilibrium in the market for air travel.
3. The impact of salmon fishing on the number of fish available to reproduce and supply the next generation is an externality.
4. The benefits forests provide for carbon sequestration constitute an externality for owners of forests.
5. Consider the erosion caused by logging along a lake shore: this does not necessarily constitute an externality.
6. As an Evergreen faculty member, I receive a free annual bus pass. This demonstrates that bus service, for me, is a public good.
7. At the University of Wisconsin, which I attended as an undergraduate, free outdoor movies are shown each summer. These are not public goods, however.
8. Salal is a commonly harvested forest product in the northwest. The market price of salal provides a reasonable estimate of the benefit the average consumer receives by buying it.
9. The automobile corporations have been cutting prices during the current recession; this does not mean that the social cost of a car has been cut, however.
10. Raising the cost of a fishing licence is a good way for the state to increase the social cost of that activity.

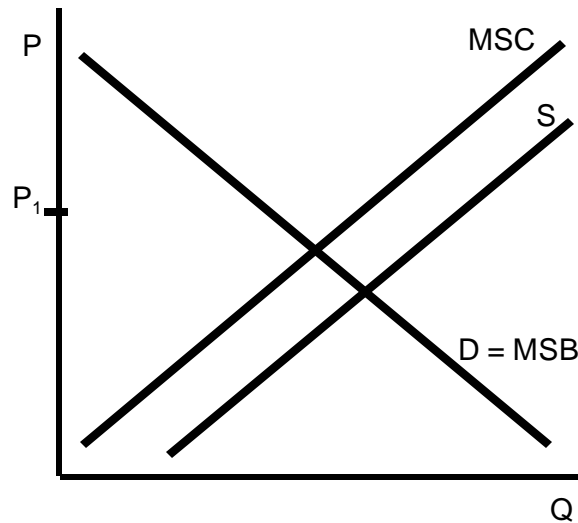
II. Draw a diagram for the market in Washington State apples, incorporating "normal" supply and demand curves, and indicate their equilibrium price and quantity. Now, for both of the following, shift either the demand curve or the supply curve in the correct direction and show how this changes the equilibrium price and quantity. Show and label the old and new curves, and the old and new equilibria, in the same diagram.

1. A blight decimates apple trees in New Zealand.
2. The US enters a deep economic recession.
3. Apples are found to possess a chemical that counteracts anthrax.
4. Migrant farmers who harvest apples in this state organize a union that can negotiate pay increases.

III. The following diagram represents the supply and demand for electricity. Note that the demand curve is assumed to represent marginal social benefits as well, while the true marginal social cost curve is above the supply curve. Suppose that prices are temporarily at  $P_1$ .

1. If consumers adjust to  $P_1$  based on their demand curve, shade in the area representing net social benefits gained by society.
2. Based on the same level of demand as in (1), shade in the area representing potential net social benefits not gained by society.

3. Suppose that the quantity supplied at  $P_1$  is determined by electricity generating companies based on their supply curve, and that consumers mistakenly purchase all of this; that is, they are temporarily off their demand curve. Shade in the area representing the net social costs resulting from this excessive quantity supplied and demanded.



IV. A river system has four dams that each generate electricity but interfere with salmon spawning. For this problem, assume that the net social benefit of each 1000 kwh of electricity is \$100, the net social benefit of each fish is \$20, and that there are no other social benefits or costs associated with the dams. The following table provides the tradeoff between hydroelectric power and salmon:

	kwh generated (in 1000's)	fish lost (in 100's)
Dam 1	300	20
Dam 2	450	20
Dam 3	100	10
Dam 4	900	50

1. What is the economically efficient number of dams that should be operated? Which ones?
2. For the next set of questions, assume that the dams are publicly owned, and that the power authority's only goal is to provide the greatest benefit to consumers through either hydroelectric generation or cash rebates, and that the fisheries are under the authority of a public agency whose only goal is to provide the greatest benefit to its constituents, either through fishing (or other use of the salmon) or cash rebates.
  - 2a. What is the most the power authority will be willing to pay for the right to operate each dam?
  - 2b. What is the least the fishery authority will be willing to accept for the operation of each dam?
  - 2c. What is the most the fishery authority will be willing to pay for the removal of each dam?
  - 2d. What is the least the power authority will be willing to accept for agreeing to remove each dam?
3. What do the above answers have to do with the Coase Theorem?