Selected brief answers for review questions for first exam, Fall 2006
AGEC 350

Don't forget, you may bring a 3x5” notecard to the exam.

These are brief answers intended to help you find the complete answers. In most cases I would expect a more complete answer on the exam. While I don’t actually draw graphs in these notes, I make reference to graphs that I hope are sufficient for you to understand what I’m saying. If you’re still in doubt, contact me and I’ll clear it up. If you’re still confused, consult with Dr. Woodward or attend one of the review sessions. Good luck.

1. A model is the structure in which we frame our analysis. If you don’t have a model, then it is virtually impossible to decipher what you observe or establish preferences over outcomes. In normative analysis, it is necessary to have a model of what is desirable (e.g., economic efficiency or sustainability). In positive analysis, the models are used to frame our assumptions on general behavior. For example, we assume in the travel cost model that people facing higher costs take less trips up but that their preferences are very similar to those that face low costs. This model, then allows us to make very specific estimation of welfare consequences of policy.

2. See figures 2.2-2.5 and figures 4.1-4.3 and accompanying text.

3. Graphical question
   a. Because they are WTP $20 or more for every unit up to the 1000\textsuperscript{th} one, and are not WTP $20 for every unit beyond the 1000\textsuperscript{th} one.
   b. Because if they receive $5 per unit they can make a profit on every unit up to the 2000\textsuperscript{th} one because their cost is less than $5, but for every unit after the 2000\textsuperscript{th} one the marginal cost exceeds $5 so they would lose money.
   c. The equilibrium price is $10, at which point the quantity demanded (4,000) equals the quantity supplied (4,000), which is why it is an equilibrium.
   d. The equilibrium is efficient because it maximizes net benefits. We know this will be true since at the equilibrium the MC will equal the MWTP. For every unit prior to the 4,000\textsuperscript{th} one, the MWTP is greater than the MC and for every unit beyond the 4,000\textsuperscript{th} one, the MWTP is less than the MC.
4. a) The distance from a to c, about 60-20=$40. b) $30. c) MNB = MB−MC = The distance from g to f, 30−50 =−20 (note it’s negative since MC is greater than WTP). d) The area abdc. e) The area kcei. f) The benefits would be aghk. It appears that the benefits are greater than the costs since the triangle aec is larger than efg. g) If the price were higher than $40 the producers would want to supply more than 200 units while the consumers would want to buy less than 200 units. On the other hand, if the price were lower than $40 the producers would want to supply less than 200 units while the consumers would want to buy more than 200 units. Only at $40 is the quantity supplied equal to the quantity demanded so that the market clears. h) If they are not allowed to produce more than 100 units, then the measure of economic inefficiency created is the welfare loss indicated by the triangle dbe. i) The externality would mean that the social MC curve is $20 higher than the private MC curve in the graph. The social MC curve would cross the WTP curve at 100 units, hence this is the socially efficient quantity. However, since neither the consumers nor the producers internalize this social cost, the market equilibrium will remain at 200. j) No in this case the good is a public good and the social WTP exceeds the private WTP. If we stack another individual’s WTP curve on top of the WTP curve in the graph, we obtain the social MB curve for an economy with two people. If person #2 is a free rider, then he or she will not participate in the economy, since the first person is already purchasing 200 units. However, at that 200 units, the social Marginal WTP would be not $40 but $40×2. Hence, social Marginal WTP exceeds the MC and the socially efficient allocation is not achieved.

5. Take a price like $30. The point on the MC curve that has a height of $30 and this tells us where the cost of that unit (the 100th) is equal $30. In other words, the 100th unit costs $30. If a business could sell its product at $30/unit, then it would make money on the first 99 units. But if the firm chose to produce an 101st unit, it would lose money on that unit. Hence, it will supply 100 units, but no more. That is why the MC curve also tells us the quantity that would be supplied at any price.

Now look at the WTP curve. We see that the WTP for the 300th unit is $30. The individual would be WTP more than $30/unit for every unit before the 300th one, and would not be WTP $30/unit for each unit beyond the 300th one. So if the price that the individual faces is $30, then he or she will demand 300 units.

6. The height of the MC curve at a particular quantity tells the additional cost of producing one more unit. The height of the WTP curve at a particular quantity tells the additional benefit (WTP) of consuming one more unit. The vertical distance between the WTP and the MC curves is the marginal net benefit provide by that unit.

7. a) normative - “should.” b) positive - explains behavior. c) positive - just describes a phenomenon that may not actually be true. d) normative - “bad.” Of course, there are positive and normative elements to almost all of these. The important thing is for you to understand the distinction between what is positive and what is normative.

8. Look at graph in lecture 7. Here the tax on equal to the marginal external cost leads to an efficient outcome. A subsidy (which would reduce the private costs that an individual would actually pay) could do the same thing for a positive externality.
9. 
   a. Trick question. Marginal net benefits will be zero. If they were positive then it would be possible to increase the quantity slightly and obtain more benefits. If it were negative you could decrease the quantity and reduce the loss. The resource is being used efficiently if the total net benefits are maximized.
   b. True, see a.
   c. False. A one-step test simply evaluates if the area under the demand curve is greater than the area under the supply curve. This can be true either to the left or to the right of the efficient level.

10. Here are a couple. The grass at the MSC has value even without being used. Aggies all over the world would be hurt if the grass were defiled. Use value is easier, e.g., shade under trees.

11. Since most policy interventions involve real costs -- we as a society have to pay something. Hence finding out how much we’re willing to pay make a lot of sense. Of course the “we” in the cost side and the “we” in the benefit side are not always the same group, so equity (fairness) issues should also be considered, though economists typically don’t have much to say about this.

12. 
   a. A positive externality on the demand curve so that the social benefits are greater than the private benefits so the market equilibrium quantity, $Q_M$, is less than the socially efficient level, $Q_S$.

   ![Diagram](image)

   b. A negative externality on the marginal cost curve so that the social costs are greater than the private costs so the market equilibrium quantity, $Q_M$, is greater than the socially efficient level.
efficient level, $Q^*$. 

c. If a stream of benefits is nonexclusive and indivisible, then it is a public good. To show why this is inefficient, use the 2-person graphical presentation of the public-good problem in lecture 7.

13. 
   a. A change that makes someone better off without making someone else worse off.
   b. Consumer surplus: A measure of the net benefits that a consumer gets from buying a product, the difference between what the consumer would have been willing to pay and what he or she had to pay.
   c. Producer surplus: Essentially the same as profit, revenue-cost.

14. One example would be efforts of the landowners to limit the speed of the ferry. The owners used the legal system to protect their property, they did not necessarily seek a socially efficient outcome.

15. Exclusivity: If your dog barks when anyone walks by, you may get the benefit of the protection but your neighbors pay the cost of the noise. Transferability: Even if you sell your dog, it might come running home to you. The full stream of benefits (including its love) cannot always be transferred to a new owner. Enforceability: Certainly, if you sell the dog, the new owners rights to the benefits of dog ownership cannot be enforced, he may not give the dog’s affection. Also, if your dog misbehaves, it might be taken from you by the government.
16. Exclusivity: all benefits are captured in the WTP/Demand curve and all costs are captured in the MC/Supply curve. Enforceability: in the price curve – the only way to get the good is to pay a positive price and the firm will be compensated for that price. Transferability: in the surplus created as the good is transferred from the seller to the buyer.

17. There are many activities organized by groups that benefit the whole campus. I’m sure the that there are often complaints that everyone isn’t doing their “fair share”.

18. a) The distance is not relevant here. We use the fact that people stopped after taking two trips when the cost per trip was $40 before and $50 after. Hence we estimate that the value of the 2nd trip is $40 before & $50 after. b) The last two columns in the table can be used to sketch out two demand curves exactly as we did in class. The area between the curves and above $20 (the travel cost of the individual) would indicate the surplus gained by the change in quality.

19. In theory, a regulatory taking occurs when a law diminishes the value of someone’s assets. In this case, the law would diminish the value of the assets of anyone who had planned on raising more than 100 hogs. Typically, such regulatory takings are not recognized by the courts; though there are exceptions.

20. Non-use value accrues to people who do not use an asset nor do they value it because of the possibility of future use. Contingent valuation, in which willingness to pay is directly elicited through surveys, is the only technique available for estimating non-use values.

21. Existence value reflects the value placed on a resource that is not related to use, either present or future. It is the willingness to pay simply to protect something’s existence. Option value refers to the value placed on an object because people want to protect the option of using the resource in the future.

22. a) Seat belts - $721.5M/1,850=$390,000 per statistical life. Benzene emissions - $1.1M/0.3=$3.66 million per statistical life. b) One way to look at WTP for safety is to look at actual consumer behavior. For example, we could estimate how much people are willing to pay for safety features in cars that reduce mortality. Another possibility is to study how much additional workers demand in salary to take more dangerous jobs.

23. We can say that they are demonstrating a minimum willingness to pay for a statistical life of at least 10,000,000 = ($30/(0.000005−0.000002).

24. By valuable, she means that people would be willing to pay to preserve the environment. By costs, she means that there are opportunities foregone (i.e., opportunity costs) when we decide to protect the environment.

25. a. 0%. Since any abatement costs the firm money, it would avoid those costs if it can. b. The socially efficient level would be where the net benefits are maximized, indicated by the cleanup level e. In this case this would happen at the level of abatement where the two curves cross. At any lower level, the willingness to pay of the public for a little more
abatement would be greater than the costs of the firm. At any higher level, the costs of the last little bit of abatement are greater than the benefits.

c. The town and the plant might strike a bargain where the town pays the plant to abate. They would have to pay the plant a dollar amount equal at least up to the area of the triangle afe. In theory (Coase’s theorem) the town would agree to pay for abatement up until the point where the WTP for additional abatement is equal to the firm’s marginal cost. Any payment more than or equal to the plants total cost of abatement and less than or equal to the town’s total WTP would be agreeable. If only the firm’s costs are compensated, then the firm would have no welfare gain and the town’s welfare would improve by the area between the WTP curve and the MC curve.

d. If the plant has no right to pollute, then the analysis would be the same as in the previous question, starting on the right, where 100% abatement would be required. Assuming that the firm compensates the town for its costs (at least dfe), the gains from the negotiations would accrue to the firm, but remember, its starting from a much worse situation and ends up much worse off under this allocation of rights than it did when it had the right to pollute at will.

26.

a. Expected benefits = $0.20 \times$160 + $0.60 \times$80 + $0.20 \times$0 = $80. Since 80>70, it would pass the one-step test and would be recommended.

b. If waiting would give a better idea about the expected payoffs, then it might make sense to wait until we have a better idea what the benefits are going to be. For example, if waiting one year would allow you to know for sure if the benefits will be zero, then it would make sense to wait.

27.

a. Complete vs. One-step: One-step simply tells whether the project’s benefits are greater than the costs, it does not tell us what the efficient size of the project should be. Complete, on the other hand, gives us the information to identify the efficient size of the project.

b. Impact vs. one-step: Impact typically considers a wider range of impacts, including impacts that can’t be valued (at least not very well).

c. One-step benefit-cost analysis vs. impact analysis: One step benefit-cost analysis puts a monetary value on all the impacts. Impact analysis simply lists all the impacts. The advantage of BCA is that it converts all impacts into comparable units, making it possible to come up with a clear yes or no policy recommendation. An advantage to impact analysis is that it doesn’t require all impacts to be valued and since the valuation of many impacts is either difficult or impossible, impact analysis is able to be more complete in its list of impacts.

28.

a. The value of the marginal external cost = the distance between the MC$_S$ and the MC$_P$ d–e or k–L

b. The area dihe

c. f

d. g

e. The area ikh
29. a) The privately efficient point is where $WTP = MC_P$ (private marginal cost). If the cost is $30 per trip, this occurs at 6 trips. b) Each trip Freddy takes imposes external costs on the people at the lake equal to $10. Hence the social marginal cost = $30 + $10 = $40 and the socially optimal number of trips would be 5. c) A daily tax of $10 on obnoxious boats would lead to the socially efficient outcome.

![Graph](image)

30. a) A regulation is typically inflexible. A liability rule, on the other hand, would force boat owners to take into account the damage caused by their wakes. They’ll choose a speed at which the benefit of speed is equal to the marginal cost to those affected by the wakes. The graph would follow those presented in lecture 8. Note: a very similar type of a question could be asked with regard to bargaining.

b) Increasing the speed of a boat leads to increases in the net benefits to boat owners. The slight initial increases probably lead to relatively minor costs to the affected parties. Hence a side payment or bribe could be negotiated that would make the boat owners better off (their increase in benefits would be less than the bribe) and would also make the affected parties better off (the payment would be greater than the actual damages suffered). Since both parties are better off, there is a Pareto improvement.

31. False. Some pollution is a necessary byproduct of production. Even though society does not like pollution (i.e., is willing to pay to avoid it) the willingness to pay for many goods exceeds the willingness to pay to avoid the resulting pollution. Hence, it is socially efficient to have some pollution. You should be able to show this using a graph of a negative externality.

Rent seeking is the use of resources in lobbying and other activities directed at securing protective legislation. It seeks to increase the net benefits to the interest group but usually lowers net benefits to society as a whole. Coaseian bargaining, on the other hand, is the use of side-payments to convince the other party to do what you desire. Coaseian bargaining leads to a Pareto improvement relative to the original allocation.