Use the following information to answer questions 8 - 10.
The diagram on the next page depicts the competitive market for peanuts. This market is initially in equilibrium with 400 tons being bought and sold at a price of $50 per ton. Consider a policy in which the government institutes a price regulation in the peanut market such that peanuts cannot be sold for less than $70 per ton. Hint: Use the diagram as needed to answer the questions, but you do not need to illustrate anything specific on the diagram.

8. How many tons of peanuts will consumers be willing to buy at this regulated price?
   a. 200.
   b. 400.
   c. 600.
   d. The same amount that farmers are willing to sell at this regulated price.
   e. Both a and d are correct.

9. Assuming that there is no mechanism to deal with the excess supply of peanuts caused by this policy, how many tons of peanuts will actually be bought and sold at this regulated price?
   a. 600.
   b. 400.
   c. 200.
   d. The same amount that consumers are willing to buy at this regulated price.
   e. Both c and d are correct.

10. Now suppose the government alters this farm policy program to further accommodate farmers by purchasing any surplus quantity of peanuts that farmers are willing to produce at the regulated price of $70 per ton. What will be the dollar cost to the government of purchasing this excess supply of peanuts at this regulated price?
    a. $14,000.
    b. $28,000.
    c. $36,000
    d. $42,000.
    e. There is not enough information to answer this question.
1. The economic problem is a result of
   a. too few resources to satisfy society's wants, needs and desires.
   b. scarcity.
   c. taxes that are too high and too much government spending.
   d. both a and b are correct.
   e. a, b and c are all correct.

2. Economics is primarily the study of
   a. how society manages its scarce resources.
   b. how to make money in the stock market.
   c. how to determine what to produce, how to produce it, and how to distribute what is produced.
   d. both a and c are correct.
   e. a, b and c are all correct.
Use the following information concerning Joe's Boat Factory to answer questions 20-22.

Joe runs a small boat factory. He can make ten boats per year. It costs Joe $200,000 for the raw materials (fiberglass, wood, paint, and so on) to build the ten boats. Joe has invested $500,000 in the factory and equipment needed to produce the boats which are now assets that he owns: $200,000 from his own savings where he was earning 5% interest and $300,000 borrowed at 10% interest. Joe can work at a competing boat factory for $80,000 per year. Hint: The funds invested in the factory and equipment ($500,000) are not treated as a cost here because they represent assets of the firm, there is however a cost associated with obtaining these funds.

20. In this example, Joe's explicit costs of production are
   a. $200,000.
   b. $230,000.
   c. $320,000.
   d. $500,000.
   e. there is not enough information to answer this question.

21. In this example, Joe's total opportunity costs of production are
   a. $230,000.
   b. $320,000.
   c. $500,000
   d. $700,000.
   e. there is not enough information to answer this question.

22. In this example, what would the price of each boat sold need to be for Joe to just earn zero economic profit?
   a. $23,000.
   b. $25,000.
   c. $30,000.
   d. $32,000.
   e. there is not enough information to answer this question.
1. Markets in Action (8 points)

a. Given the initial conditions in the market for beachfront cottages below (P1, Q1), clearly illustrate the shock that characterizes the busy season being careful to label all new curves and the new P and Q. Very briefly explain the disequilibrium caused by the shock as well as the process of adjustment to the new equilibrium. **Hint:** You must be very specific, but brief in your description of the disequilibrium and the adjustment process. Also be sure to clearly state whether the new price is higher or lower relative to normal times given this shock. (4 points)

The busy season happens in the beachfront cottage market because lots of people want to stay at the beach in the summer time.

This can be shown as a shift of the D curve to the right.

This will result in an excess demand putting upward pressure on the price.

Sellers will respond to the higher prices by being willing and able to sell more. (mostly part-time vacation home rentals)

\[
\begin{align*}
D \uparrow & \quad 	ext{shortage} \quad P \uparrow \quad Qs \uparrow \\
S1 & \quad P1 \quad D1 \quad Q1 \\
S2 & \quad P2 \quad D2 \quad Q2
\end{align*}
\]

b. Suppose that a new and improved growing and harvesting method has been introduced to cranberry farmers and there is also a new study linking cranberry consumption to significant health benefits. All else equal, very briefly describe what you would expect to happen as a result of these simultaneous events in the cranberry market relative to the initial situation (before either event occurred)? **Hint:** Your answer must be very thorough, but also brief and to the point. Be very specific in terms of both the new price and quantity of cranberries bought and sold. You may also want to refer back to multiple choice questions 8 and 9. (4 points)

An improved growing and harvesting technique will result in farmers being willing and able to bring more cranberries to market no matter what the price is.

\[
\begin{align*}
\uparrow S & : \quad P \downarrow \quad \text{and} \quad Qd \uparrow \\
\uparrow D & : \quad P \uparrow \quad \text{and} \quad Qs \uparrow
\end{align*}
\]

Evidence that cranberries have significant health benefits will increase tastes and preferences for cranberries meaning consumers will be willing and able to buy more no matter what the price is.

If these shocks happened simultaneously then we would expect to see more cranberries being bought and sold compared to the initial situation because both events result in quantity increases.

However, the supply shock pushes the price down while the demand shock pushes the price up so the new price after both shocks will depend on the magnitude of each shock.

\[
P \downarrow \quad \text{if} \quad \uparrow S > \uparrow D \\
P \uparrow \quad \text{if} \quad \uparrow D > \uparrow S
\]
2. Traffic Congestion & Price Elasticity of Demand (3 points)

Suppose a city is considering a policy to reduce congestion in the downtown area. They decide that lowering the bus fare would make the bus more attractive and lead to less cars and less congestion. The city hires an economist to research this issue and she reports that the estimated price elasticity of demand for bus rides is -0.2.

a. Carefully state in words exactly what the elasticity of -0.2 means. **Hint:** You must be very specific. (1 point)

*For every 1% change in price (↓) there will be a corresponding 0.2% quantity response (↑).*

b. Given your answer to part a, is the policy of lowering bus fares likely to be successful in reducing congestion. Very briefly explain. **Hint:** Be very specific and be sure to refer to your answer to part a when answering here. (2 points)

*This policy is not likely to be successful because even a 10% reduction in bus fares will only increase ridership by 2%. Consumers are unresponsive to price changes meaning demand for bus rides is inelastic and therefore, it would require an extremely large price reduction to get people out of their cars and onto the bus.

Simply put, people do not see the bus as convenient and therefore do not perceive the bus to be a close substitute for car travel and therefore do not switch in response to just a price decrease in the bus fare.*

3. Positive/Normative Economics: Botox & Dental Care (6 points)

Very briefly explain the relationship between positive economics and normative economics in the context of economic analysis. In particular, please comment on the Botox and dental care example from class as a real world example of normative and positive economics in action. **Hint:** This question requires a bit of thought, however your answer should be brief and to the point.

*Positive economics refers to the scientific method of analyzing and describing the way the economy operates. Normative economics refers to the discussion of policy prescriptions designed to improve society.

The key to understanding economics is the interaction between positive and normative analysis. That is, valid normative policy prescriptions must be based on sound positive analysis.

In the market for Botox there was an increase in the quantity of services being produced and consumed as well as an increase in the amount of money being spent as demand has increased.

This is how markets operate by guiding resources to their most valued use in terms of willingness to pay.

In the market for dental care there are many who go without care due to high prices, including a significant number of children. Again, this is how markets operate and some people go without as price serves as a rationing mechanism.

This is not fair, but it is efficient in an economic sense.

If this outcome is socially undesirable, we could say the government should possibly become more involved.

Medicaid is a government program designed to provide dental services to the poor. In general, this program does not work because it is under-funded.

One possible solution would be to tax the consumption of Botox procedures and use the revenue to fund dental care for the poor.

This policy prescription is not a perfect solution and there are tradeoffs, but it would be a starting place for discussion and debate over this looming crisis as identified in the newspaper headline.*
4. Externalities: Airports & Chicken Litter  (6 points)

a. The article titled *Battle Over Fort Lauderdale Airport Runway Takes a Legal Turn* describes a real world example of an externality. Very briefly explain under what circumstances the airport runway in question should remain closed. **Hint:** Your answer should be very brief and to the point. Be sure to use economic reasoning and keep your answer simple. (3 points)

*The airplanes using the runway create noise resulting in economic damage to the bordering neighborhood. The cost of reducing the noise by closing the runway is seen in delayed flights, increased travel time and reduced profits for airlines.*

*Economic theory suggests that the efficient solution to this externality problem would be to close the runway if and only if the benefit of doing so was greater than the associated cost (noise vs. delays).*

*Since the runway is already closed, it must have been determined at some point that the benefit of closing the runway (less noise and increased property values) was greater than the cost of closing it (delays etc…).*

*Over time the delays have grown as population has increased and there is more pressure to open the runway. The runway should remain closed if and only if the cost of leaving it closed is less than the benefit.*

*Notice that in reality solving externalities requires litigation due to the high stakes and the difficulties in measuring costs and benefits.*

b. The article titled *It's OK to Make Polluters Pay* describes a real world example of an externality. Very briefly state the problem that arises as chicken is produced and clearly state a possible solution that is being proposed. **Hint:** Your answer should be very brief and to the point. Be sure to use economic reasoning and keep your answer very simple. (3 points)

*If the production of chicken is causing pollution of the waterways then the social cost of production exceeds the private cost of production that the firm faces leading to over-production.*

*In fact, the definition of a negative production externality is that there is a spillover cost not being borne by producers.*

*Economic theory suggests that forcing chicken producers to pay the added cost through a tax would move output closer to the optimal level for society. In short, a tax on producers would internalize the externality.*

*The likely outcome would be less chicken produced and higher chicken prices at the grocery store.*

*Notice that in reality solving externalities requires litigation due to the high stakes and the difficulties in measuring costs and benefits.*
5. Opportunity Cost in the News (6 points)

a. The article titled *Energy Bill Needs Compromise on Renewables*, discusses two specific policy changes. The first change is an increase in the average fuel economy of an auto maker’s fleet to 35 mpg by 2020. The reason for this policy is to reduce fuel consumption, but as we know from class, this will not be free. Very briefly state the opportunity cost of this policy change as stated in the article. **Hint:** Your answer should be very brief and specific. Please think about our discussion in class about gas taxes to raise revenue. **(3 points)**

*If people use less gas as a result of increased fuel economy standards then the gasoline tax will generate less revenue. Because this revenue is used to build and maintain roads, we will have less money for this purpose.*

*The article states then that we will need to have increased taxes from other source in order to make up the difference. The end result is that we will end up paying more as a society if we want cleaner air.*

*There are also additional costs of this policy imposed on automakers to re-tool factories to produce the new more fuel efficient cars. Similarly, it is likely that these new cars will also cost consumers more as well.*

b. Later in the same article there is a second policy change discussed that would require all energy plants to produce 15% of their electricity from renewable energy sources (wind, solar, biofuels). The reason for this policy is to lessen the negative environmental impact from energy creation (currently most energy is produced by burning coal). Once again we know from class that this will not be free. Very briefly state the opportunity cost of this policy change as stated in the article. **Hint:** Your answer should be very brief and specific. **(3 points)**

*Simply put, the article states that some energy plants (especially those in the Southeast and Midwest will not be able to meet this requirement without raising prices).*

*The end result is that we will end up paying more as a society if we want cleaner air.*

*There are also additional costs of this policy imposed on people who will possibly lose their jobs as the coal industry loses steam (pardon the pun).*
6. Pollution and Externalities (5 points)

a. Captain Planet advocates reducing pollution down to zero. Very briefly explain why we as a society allow the level of pollution that we currently have rather than reducing to zero pollution. **Hint:** Keep your answer simple and use basic economic reasoning. (2 points)

Economic reasoning suggests that we should only clean up if the cost of reducing pollution further is less than the benefit to society from doing so.

Because the last few units of pollution cleaned up will likely have a large cost and a small benefit, some amount of pollution above zero will be optimal for society.

For example, zero pollution would require walking everywhere for transportation (a very high opportunity cost).

b. Very briefly explain the most basic/fundamental (but also significant) problem that society faces in determining what level of pollution is optimal. **Hint:** Keep your answer simple and recall what we discussed in class. (3 points)

It is nearly impossible to scientifically quantify the dollar amount of the damage caused by pollution. In short, there are many stakeholders and the stakes can be very high and reasonable people can disagree over the costs and/or benefits of pollution reduction.

This scenario is made even more complex given the many wants, needs and desires of society in combination with our limited productive capabilities due to scarcity.

As a result, we likely under-value pollution reduction and over-estimate costs resulting in higher levels of pollution compared to what is truly optimal for society.

This is particularly true in the case of carbon emissions and the possible effects of global warming. Despite all of the current research we do not know for sure if global warming is real.

More importantly, any negative effects we are being warned of are off in the future and so we discount their importance and continue our current lifestyles rather than incur the costs involved in changing our behavior.
7. Market Simulation Activity (6 points)

Consider the market simulation activity that we did in class where you all played the role of buyers and sellers in the market for computer chips. Very briefly explain how the behavior of buyers and sellers moved the market towards the equilibrium. Be sure to mention what happened from round to round and also clearly describe what economists mean when they say that the market equilibrium is efficient.

First we had the rules of the game in place and understood by all market participants. Then competition and information exchange through interaction resulted in a narrowing of the price toward equilibrium.

This process resulted in more and more transactions and an increased level of well-being among market participants.

Eventually, the market arrived at equilibrium with the level of well-being maximized as a result of all of the mutually beneficial transactions occurring at the equilibrium price.

See below for a more detailed description of the process!

Buyers knew their willingness pay from the card and interacted with sellers to negotiate prices and engage in transactions. Buyers were trying to buy for as little as possible in an effort to improve their well being.

Sellers knew their willingness sell from the card and interacted with buyers to negotiate prices and engage in transactions. Sellers were trying to sell for as much as possible in an effort to improve their well being.

In round 1 neither buyers nor sellers had very much information and therefore very few transactions occurred and most players only improved their well being by a small amount.

Looking at the transactions that occurred in round 1 provided information to both buyers and sellers.

Sellers that had sold for low prices saw transactions at higher prices and knew that they could sell for more in round 2.

Buyers that had paid relatively high prices saw transactions at lower prices and knew that they could buy for less in round 2.

Based on this information market participants adjusted their behavior and competitive forces drove the price into a narrow band between $4.10 and $4.40.

This competitive process facilitated many more transactions and both buyers and sellers were able to gain and improve their individual well being by much more than in round 1. This process continued in round 3 as well.

Market equilibrium is defined as the price that facilitates all of the transactions that can benefit market participants.

In the market simulation game the price floated to the level where all of the beneficial transactions occurred thereby maximizing the well being among market participants.
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**IN THE CHIPS: S & D**

![Graph showing demand (Qd) and supply (Qs) curves](image-url)
Extra Credit: Tradition & Tradeoffs.....Energy Use & Opportunity Cost (4 points)

In an effort to reduce energy consumption during the late 1970s energy crunch President Jimmy Carter asked households to turn their thermostats down and wear sweaters. Given all of the renewed talk about energy use, pollution, global warming and dependence on foreign oil, suppose that there was a new proposal from the current White House asking all households to forgo all decorative lighting during this holiday season to come. Please comment on this policy statement based on your knowledge of economics. You must be very specific and you must use some economics. A very good answer will receive 4 points.

Nearly everyone feels strongly about the tradition of holiday lighting as do I. More importantly nearly all of you noted that you did not think the policy would work.

Moreover, many of you mentioned that in order for such a policy to have any chance of working there would need to be some sort of immediate incentive.

This is exactly what I want you to be thinking about. In fact, most people see the problem of pollution and perhaps global warming off in the distance, but we are not directly affected by these issues today.

Therefore, we are content with living our lives as we have become used to doing.

This includes buying stuff and driving our cars and of course holiday lighting. Simply put, the cost of change is too great given the perception of current benefits.

My point was to get you thinking that any hope we have as a country and a society (and in fact a world) of addressing these important issues will require sound policy and incentives and of course change and compromise.

The other point I was hoping to make was that economics will most definitely be part of the answer as we seek to solve our various societal problems.

For more practical information on how to conserve energy visit the US Department of Energy website at [http://www.energysavers.gov/tips.html](http://www.energysavers.gov/tips.html).

For those of you who feel that this type of policy would not make a difference in the big picture of our energy use and carbon emissions I would like to draw your attention to an event that took place in March of both 2007 and 2008 and was done again in 2009.

I am referring to Earth Hour where many cities around the world turned off their lights for one hour. If you are interested you can find out more on the internet at [http://www.earthhour.org](http://www.earthhour.org).

The bottom-line is……..

It is nearly impossible to scientifically quantify the dollar amount of the damage caused by pollution.

As a result, we likely under-value pollution reduction and over-estimate costs resulting in higher levels of pollution compared to what is truly optimal for society.

This is particularly true in the case of carbon emissions and the possible effects of global warming. Despite all of the current research we do not know for sure if global warming is real.

More importantly, any negative effects we are being warned of are off in the future and so we discount their importance and continue our current lifestyles rather than incur the costs involved in changing our behavior.