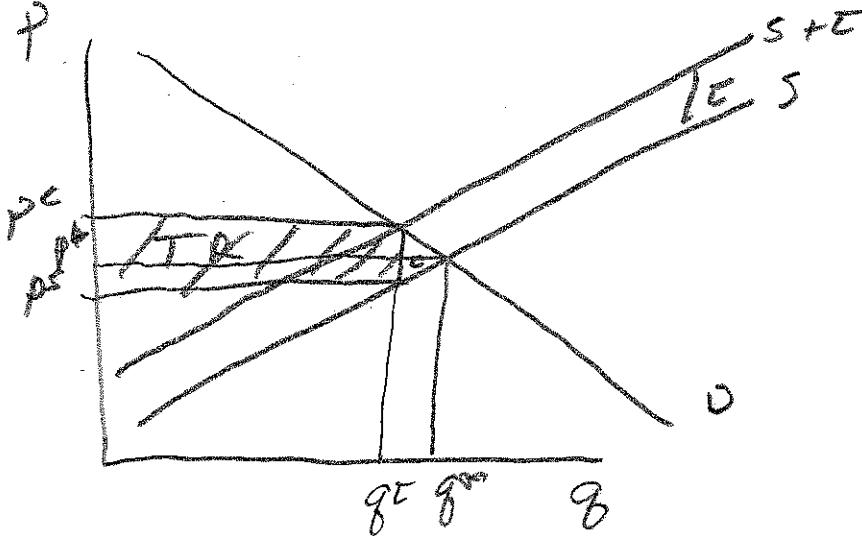


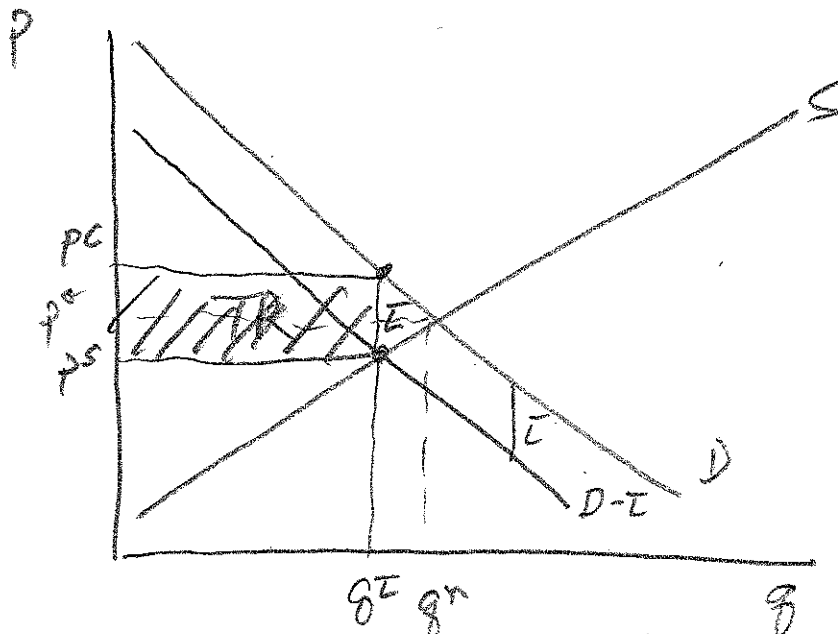
The total exam is worth 25 points. Each numbered question is worth 2 ½ points, and each sub question within a numbered question is worth an equal share of the 2 ½ points.

1) Taxes

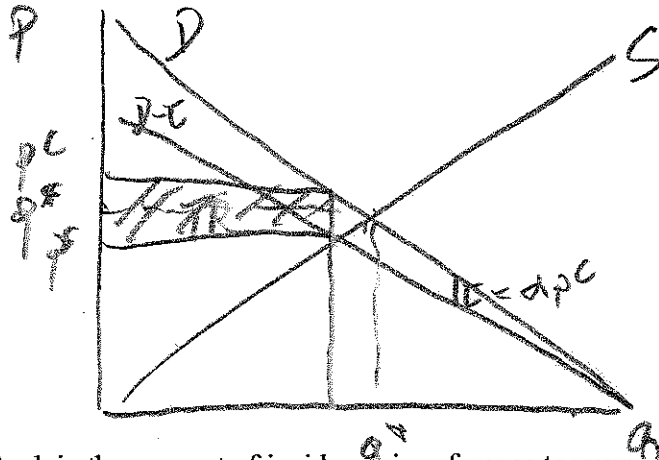
- a. Show the impact of a specific tax of size τ placed on producers. Note the price paid by consumers, the price received by producers, the equilibrium quantity and the tax revenue, and contrast this to the pre-tax price quantity pair.



- b. Show the impact of a specific tax of size τ placed on consumers. Note the price paid by consumers, the price received by producers, the equilibrium quantity and the tax revenue, and contrast this to the pre-tax price quantity pair.



- c. Show the impact of an ad valorem tax rate α placed on consumers. Note the price paid by consumers, the price received by producers, the equilibrium quantity and the tax revenue, and contrast this to the pre-tax price quantity pair.



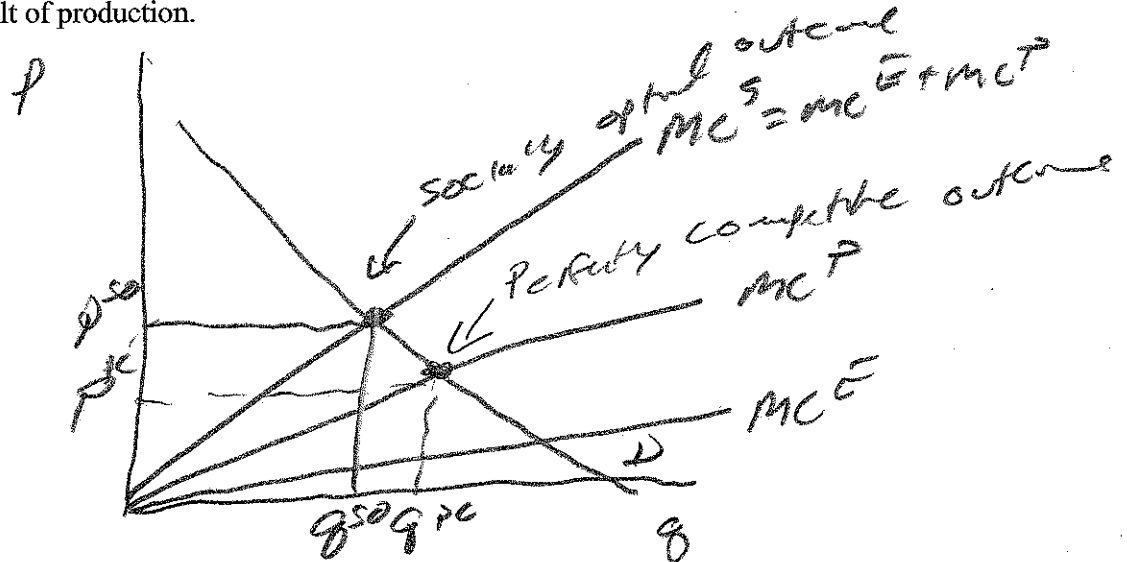
- d. Explain the concept of incidence in reference to your answer to part c of this question.

Consumer incidence reflects the share of the tax burden that falls on consumers. It is defined using the notation of (c) by:

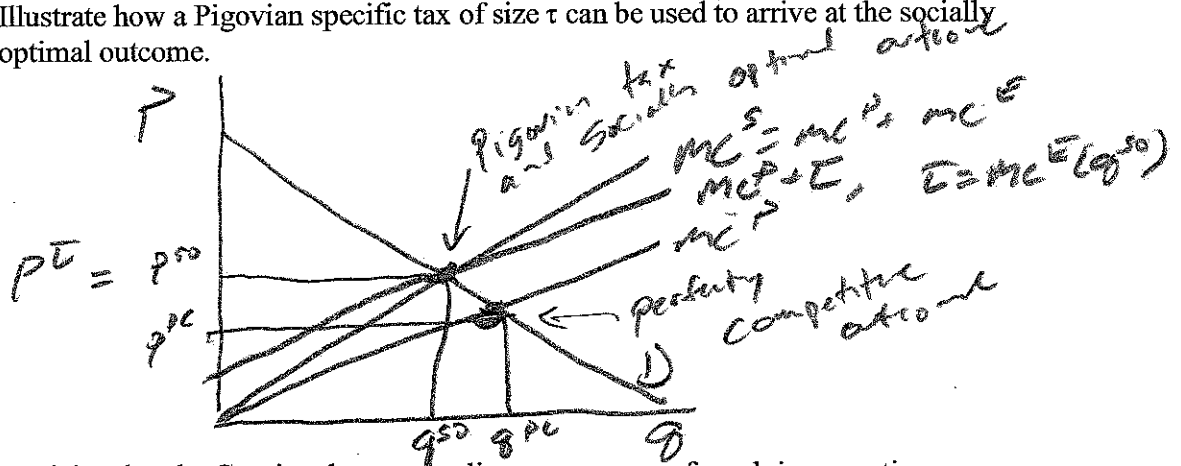
$$CI = \frac{P_c - P^*}{T} \text{ , or } \frac{P_c - P^*}{\alpha P_c}$$

2) Externalities.

- a. Illustrate on a graph why the perfectly competitive market does not lead to the socially optimal outcome in the presence of a negative externality generated as a result of production.



- b. Illustrate how a Pigovian specific tax of size τ can be used to arrive at the socially optimal outcome.



- c. Explain what the Coasian theorem outlines as a means of resolving negative externality problems.

In the absence of transactions costs and with symmetric information, we can resolve externality problems by assigning property rights to either the harmed or harming party and allowing them to negotiate over compensation for the harm.

- 3) The own price demand elasticity for unleaded gasoline in the Syracuse area is -0.6.
- a. Is the own price demand elasticity for unleaded gasoline infinitely inelastic, inelastic, perfectly inelastic, elastic, unit elastic, or infinitely elastic?

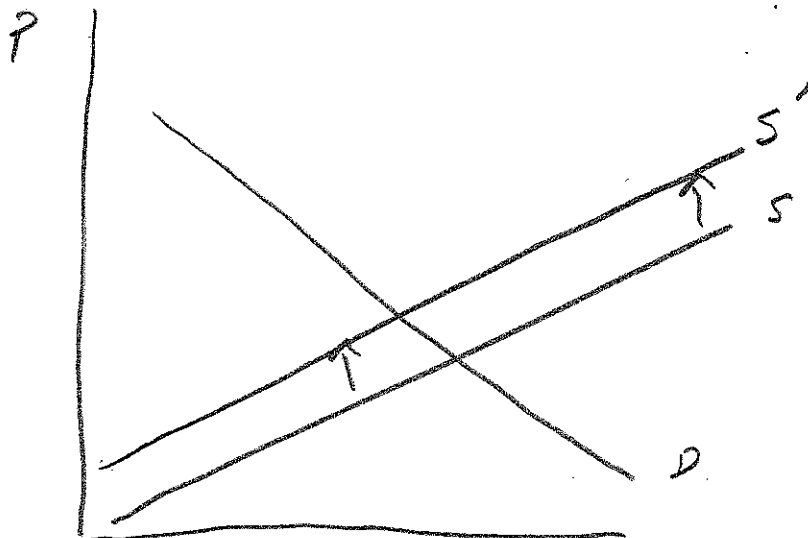
Inelastic $| -0.6 |$ is between zero and one.

- b. Over the past six months, the price of unleaded gasoline has gone up by 30%. By what percent (and in a positive or negative direction) has quantity changed according to the elasticity given above?

$$\epsilon = \frac{\% \Delta Q}{\% \Delta P}, \quad -0.6 = \frac{\% \Delta Q}{+0.30}, \quad \% \Delta Q = .30(-0.6) = -.18$$

18% reduction

- c. Using a supply and demand graph, illustrate and describe in words what you believe will be the impact on the gasoline market in Syracuse over the coming year as a result of the recent oil spill in the Gulf of Mexico (all else equal).



Oil that would have been refined in the US has been lost reducing the supply in the market, making fuel prices likely to increase. Could also argue that unexpected clean up costs have to be made so the marginal cost of fuel will go up to reflect these additional costs.

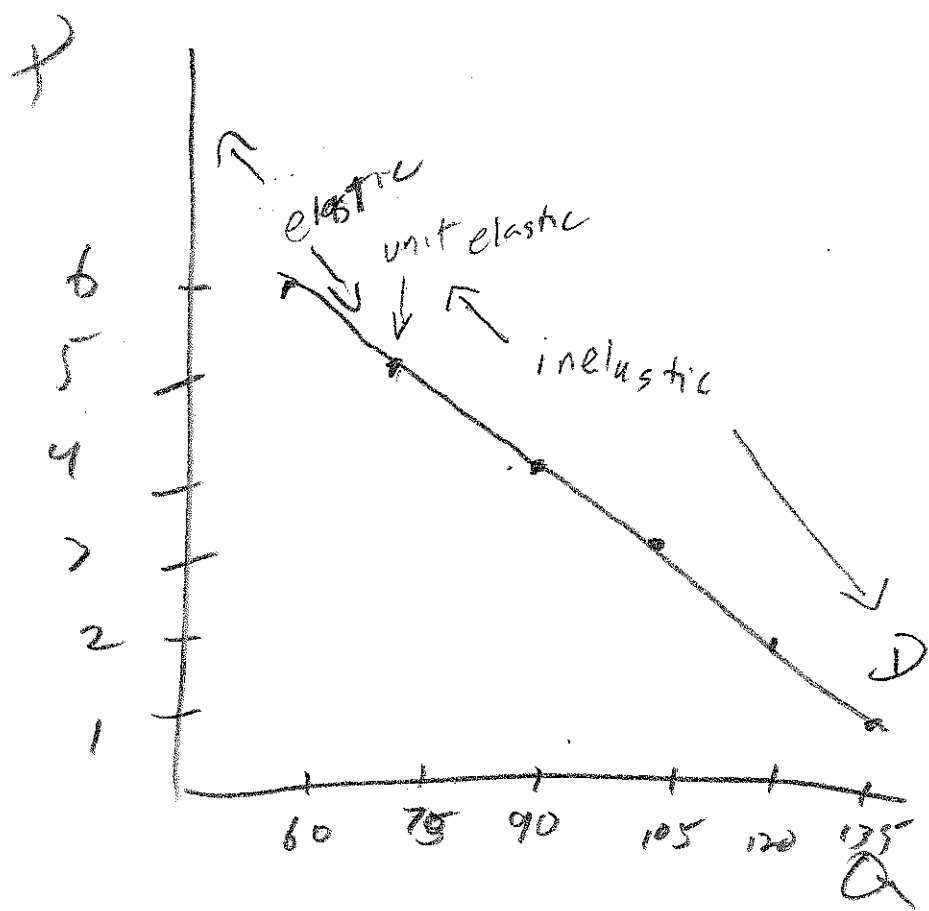
4) The demand curve is given to you as $q=150-15p$.

a. Fill out the following table (use the relatively higher price / relatively lower quantity pair for the elasticity calculation)

Price	Quantity	Elasticity
1	$150 - 15 = 135$	-----
2	$150 - 30 = 120$	$-15 \cdot (2/120) = -\frac{1}{4} = -0.25$
3	$150 - 45 = 105$	$-15 \cdot (3/105) = -\frac{1}{3} = -0.33$
4	$150 - 60 = 90$	$-15 \cdot (4/90) = -\frac{2}{3} = -0.67$
5	$150 - 75 = 75$	$-15 \cdot (5/75) = -1 = -1.0$
6	$150 - 90 = 60$	$-15 \cdot (6/60) = -1.5$

$$E = \frac{\Delta Q}{Q} \cdot \frac{P}{\Delta P}$$

b. Draw this demand curve with price on the y-axis and quantity on the x-axis. Identify the range over which this curve is elastic or inelastic.



5) The price per day of private after school care programs for elementary age children has increased by almost 50% from this time last year. Assume each explanation listed below is hypothesized to be the sole cause of this price increase. Which of the following explanations can you rule out, and which can you not rule out.

Explanation	Rule out	Not Rule Out (circle)
Consumers' income in this area has gone down significantly since last year.	Rule out	Not Rule Out
New rules require all staff at after school programs must have graduate level training in elementary education.	Rule out	Not Rule Out
The public schools have opened up an after school program for elementary students that is free for all city residents.	Rule out	Not Rule Out
One of the large private after school care programs in the area had to close for a year to renovate their facilities.	Rule out	Not Rule Out
Concerns about the safety of students in after school programs has led to a rule requiring all after school programs to install video cameras at all doors and have 1 security guard for every 20 children.	Rule out	Not Rule Out
Programs in the state of New York received a large grant for this year from the Gates foundation that is being used to subsidize the costs of after school programs.	Rule out	Not Rule Out

opposite of
A

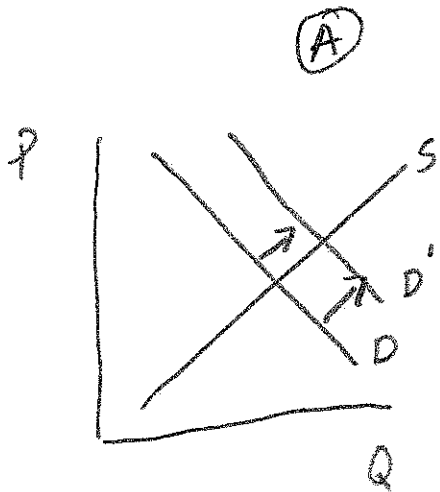
B

opposite of
A

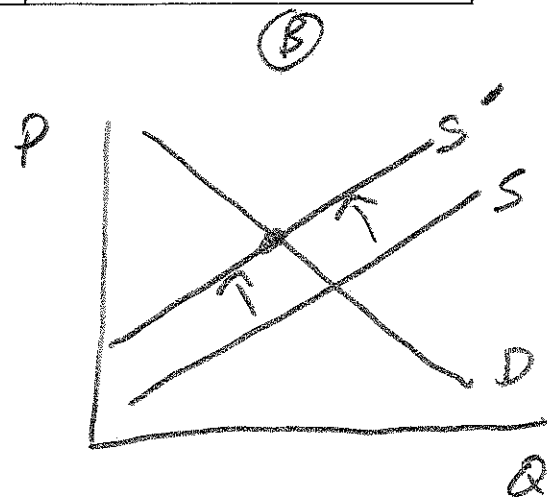
B

B

opposite of
A



or

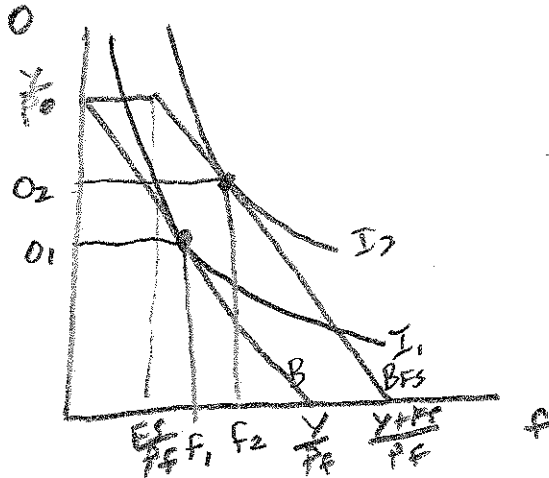


6) Circle the correct answer.

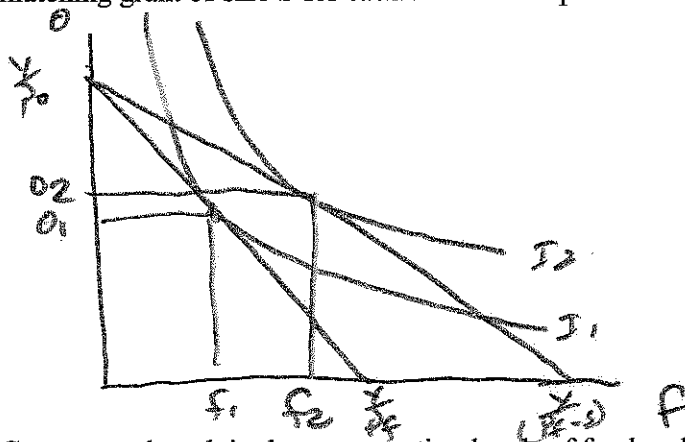
Statement	The statement is (circle the correct answer)
The expansion path traces out all points that maximize profits.	True <input checked="" type="radio"/> False
Consumer surplus is calculated as the area below the demand curve and above the price line.	<input checked="" type="radio"/> True False
The slope of an indifference curve is called the marginal rate of substitution.	<input checked="" type="radio"/> True False
The income elasticity of demand for an inferior good is a positive number.	True <input checked="" type="radio"/> False
MRS=MRT at the optimal bundle for an interior solution.	<input checked="" type="radio"/> True False
Increasing the discount rate increases the present value of future costs and benefits.	True <input checked="" type="radio"/> False
A monopolist is a single supplier of a good for which there is no close substitute.	<input checked="" type="radio"/> True False
The cross price elasticity for a complement is negative.	<input checked="" type="radio"/> True False
The free rider problem leads to overprovision of a public good.	True <input checked="" type="radio"/> False
As the Gini coefficient for the distribution of income increases, this indicates inequality is decreasing	True <input checked="" type="radio"/> False

7) Budget Constraints. There are two goods, food (f) and other (o). The price of food is p_f , the price of other is p_o . Income is Y . Hence the budget constraint is $p_f \cdot f + p_o \cdot o = Y$.

- a. Draw the budget constraint and indifference curves for a consumer showing the optimal bundle with the original budget line and after the consumer has received food stamps of cash value FS .



- b. Draw the budget constraint and indifference curves for a consumer showing the optimal bundle with the original budget line and after the consumer has received a matching grant of size S for each unit of food purchased at price p_f .



- c. Contrast and explain the consumption levels of food and other before and after the matching grant was given in question b.

In both cases, preferences are such that consumption of both food and other increase as a result of the subsidy.

NOTE: this does not have to be the case. It could be $f \uparrow, o \downarrow$, $f \downarrow, o \uparrow$, or $f \uparrow, o \uparrow$ depending on how you draw the indifference curves.

8) Briefly describe how each of the following can justify government policy response.

a. The adverse selection problem in a health insurance market.

People who buy insurance have information about their "type" that is not known to the seller of insurance. If people self-select, you end up with people buying insurance who are more prone to use it than the population average. It is less costly and more effective if the whole population has bought insurance. Could also

b. The moral hazard problem in an automobile insurance market

Those who purchase insurance are more likely to take risks knowing they have insurance to cover them. We want to limit this by making everybody be required to buy insurance and having things like deductibles.

and there is a public good aspect of community wide health

c. The information asymmetry, adverse selection problem in a used car market.

Owners of vehicles have information about a vehicle that the purchasers do not have. Full disclosure laws that mandate provision of information as a requirement of the transaction are a possible public policy response to allow the market to function, otherwise adverse selection will leave us with only "lemons"

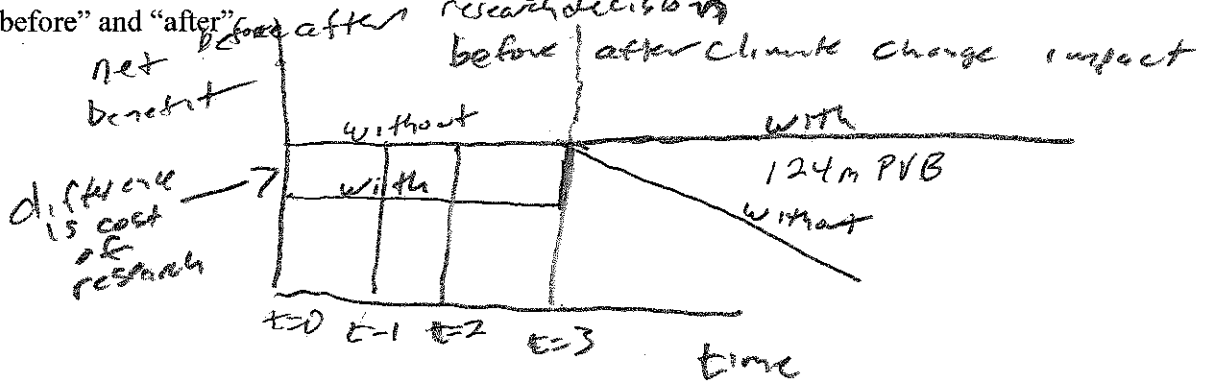
d. The free rider problem in public good provision. In the used car market,

The socially optimal quantity of a public good to provide is determined by the vertical summation of WTP for all members of society. Due to there being no means of exclusion people have an incentive to benefit from the public good without paying what is worth to them. The free rider problem leads to underprovision of the public good. If we make provision mandatory we can avoid/reduce this problem.

9. Benefit cost.

We are worried that climate change will negatively impact yields of rice in the Gambia. Over the next three years ($t=0, t=1, t=2$), we could invest in research that is aimed at developing new varieties that will be as productive as current varieties after climate change leads to a 2.5 Celsius increase in mean temperature in the Gambia starting in $t=3$. Without the development of new varieties, this predicted increase in temperature will lead to a reduction in the rice sector's contribution to GNP. The present value net benefits of the "with investment to develop new varieties to maintain current yield levels" over the "without investment to develop new varieties so we have declining yields" has been estimated to be 124 million current USD.

a) Draw the net benefit stream over time with time on the x-axis and net benefits on the y-axis for the "with" and "without" scenarios, being sure to contrast "with" and "without" with "before" and "after" ^{research decision} ~~research decision~~ ^{climate change impact} ~~climate change impact~~



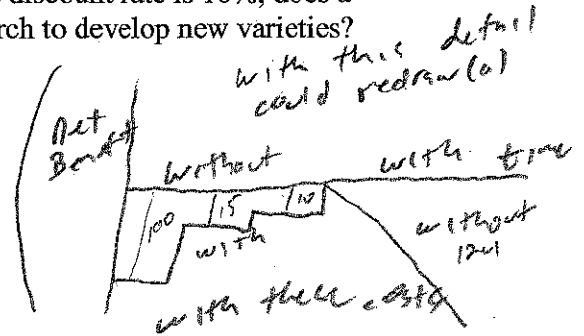
b) If it will cost us 100 million this year ($t=0$), 15 million next year ($t=1$), and 10 million the year after that ($t=2$) for the research in the "with" scenario and the discount rate is 10%, does a benefit cost test tell us we should or should not invest in the research to develop new varieties?

$$PVC = 100 + \frac{15}{1.10} + \frac{10}{1.10^2}$$

$$PVB = 124$$

$$NPV = 124 - 121.9$$

$$NPV = 2.1 \text{ m}$$



c. It turns out after we have implemented the project that the estimated present value benefits we used in answering (b) overestimated by 10% (so benefits turn out to be 90% of what you used above). Would have made the same decision as in (b) if we had used the correct benefit estimate?

$$.90 \text{ PVB} = .9(124) = 111.6$$

No, now

$$PVB - PVC = -10.3 \text{ m}$$

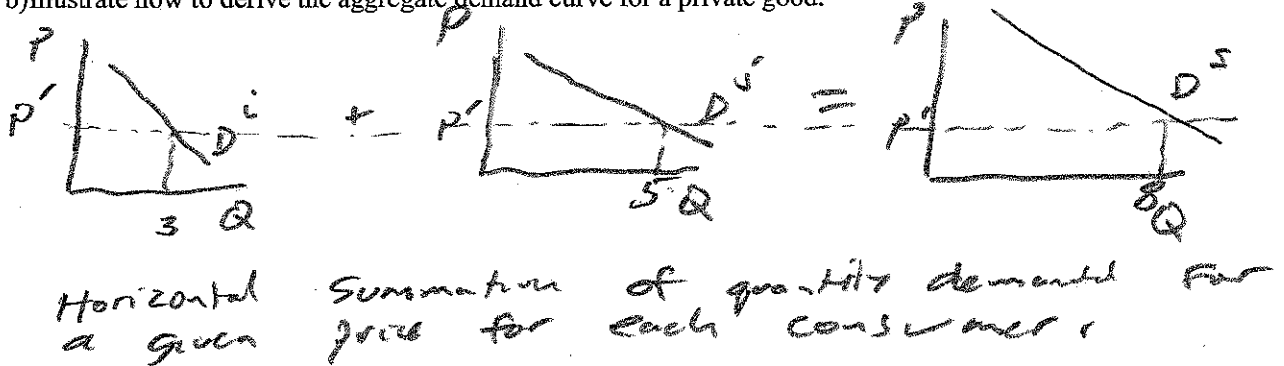
$$111.6 - 121.9 = -10.3 \text{ m}$$

10) Types of Goods.

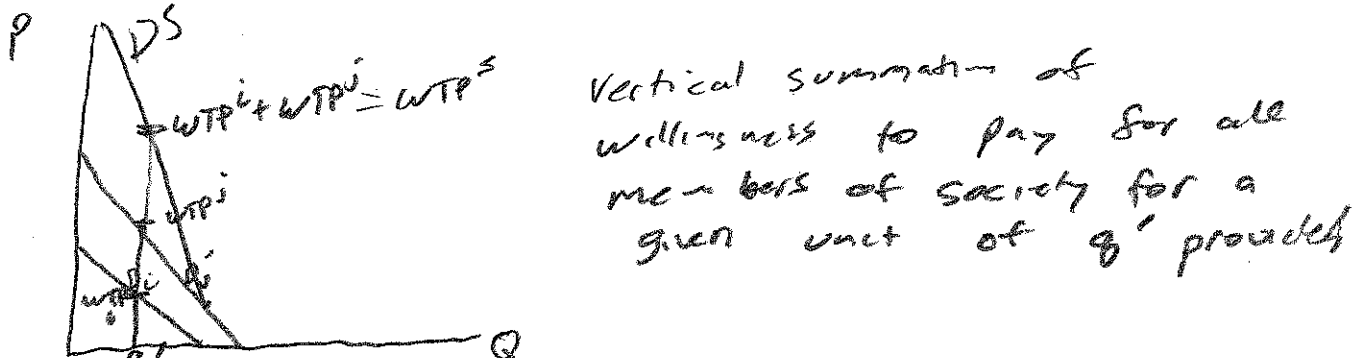
a) The categories are public goods, private goods, club goods, and open access goods. What type of good goes in which blank?

	Rival	Non Rival
Exclusion	Private good	Club good
Non-Exclusion	Open access good	Public good

b) Illustrate how to derive the aggregate demand curve for a private good.



c) Illustrate how to derive the aggregate demand curve for a public good.



d) Describe two different methods that can be used in empirical studies to estimate consumers' willingness to pay for the provision of public goods.

- 1) Contingent valuation. Survey method to ask, contingent on provision of a specified public good, how much would people be willing to pay?
- 2) Hedonic methods. Look for information about the value of a public good that is captured by a private good that has as a characteristic a public good - air quality for example.

Extra question 1:

Voting on the funding for the Syracuse City School District. Syracuse faces a substantial decline in state funds due to the economic crisis. It is voting on how many teachers to cut. It can issue bonds to earn some money to fill the funding gap. We are voting on the budget and bond strategy. Our options are:

Low Budget, No bonds – low cost budget, 500 teacher jobs lost

Medium Budget, Low Bonds – medium cost budget, 250 jobs lost

High Budget, High Bonds – highest budget, no teacher jobs lost

Four groups in society:

Moderates, who prefer Medium, to High, to Low (30%)

Fiscal Conservatives, who prefer Low, then Medium, then High (35%)

People with kids enrolled in the city schools, who prefer High, to Low, to Medium (25%)

Teachers, who prefer High, to Medium, to Low (10%)

Preferences over Budget Levels				
	First Choice	Second Choice	Third Choice	Percent of the vote
Moderates	Medium	High	Low	30%
Fiscal Conservatives	Low	Medium	High	35%
Effective Schoolers	High	Low	Medium	25%
Teachers	High	Medium	Low	10%

For each agenda, describe the voting in each round and the final outcome.

Agenda A: Compare High to Low, then winner takes on Medium

H	L		H	M	
30%	35%		25%	30%	
25%			10%	35%	M
10%			35%	65%	wins
65% to 35% H wins			35% to 65%		

Agenda B: Compare Medium versus Low, winner takes on High

M	L		L	H	
30%	35%		35%	30%	
10%	25%		25%	10%	H
45% to 60% L wins			75% to 65%		wins

Agenda C: Compare High versus Medium, winner takes on Low

H	M		M	L	
25%	30%		30%	35%	
10%	35%		10%	25%	L wins
35% to 65% M wins			40% to 60%		

Describe how this illustrates the power of agenda setting in a democracy.

By framing the question in a given way, the person setting the agenda can shape which policy will be selected in the election. This is without changing preferences or composition / characteristics of those who are voting.