Economics 3250 Dr. Lozada
Spring 2016 Exam 1

This exam has 25 points. There are six questions on the exam. Most of the questions are worth 4 points, but one is worth 5 points.

Put your answers to the exam in a blue book or on blank sheets of paper.

You have the entire class period (that is, until **1:10pm**) to take this test.

Answer the questions using as much precision and detail as the time allows. Correct answers which are unsupported by explanations will not be awarded points.

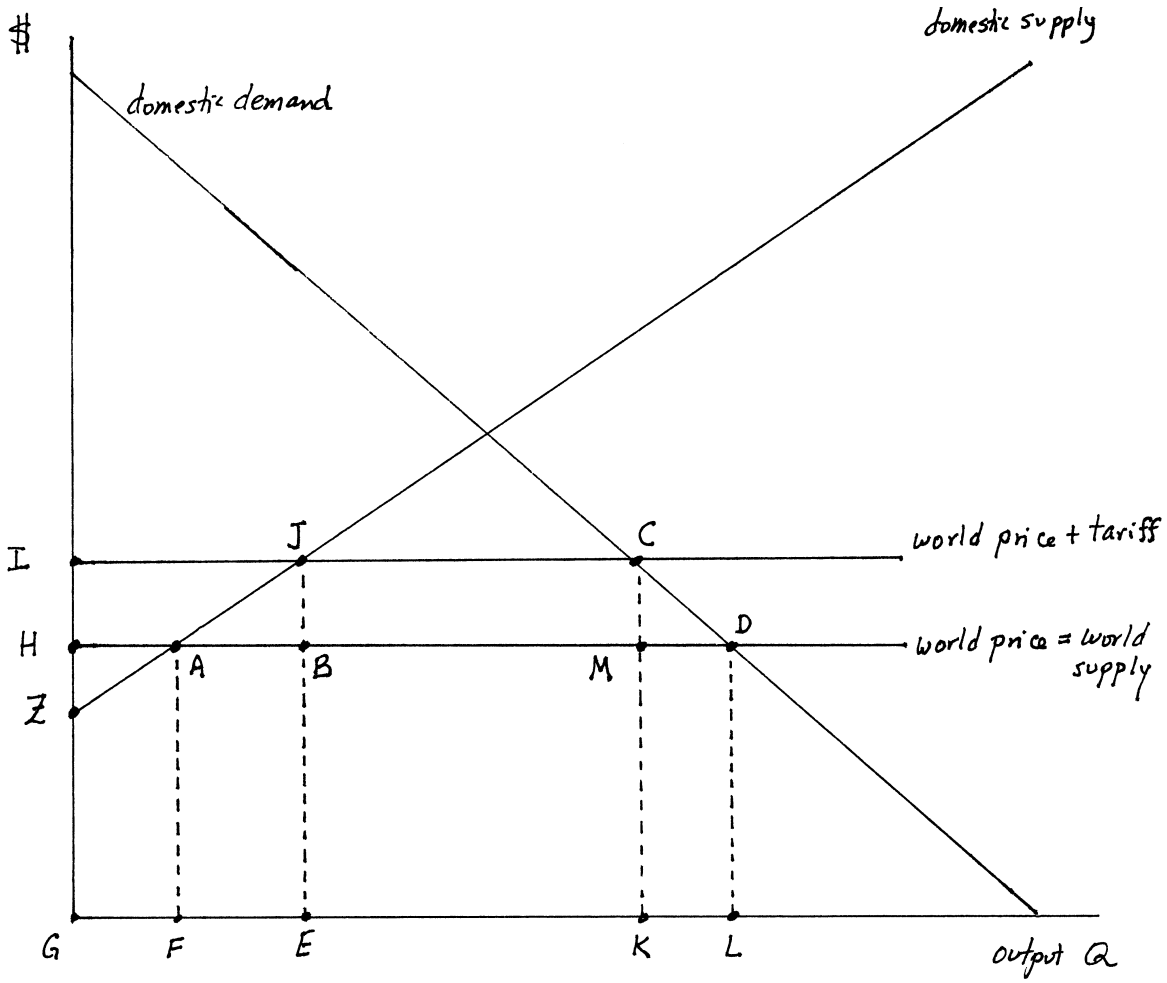

$
domestic supply
domestic demand
J
C
world price + tariff
I
H
D
world price = world supply
A
B
M
Z
G
F
E
K
L
output Q

Figure 1

Answer all of the following six questions.

1. **[4 points]** In this class we usually assume that a firm's "total revenue" curve, graphed with output q on the horizontal axis and dollars on the vertical axis, is a straight line going through the origin $(0, 0)$. What name do economists give such firms? How common are they in a developed economy such as the US? As always, explain your answers.

2. **[4 points]** Use Figure 1 and the following table to argue that, in this simple context, tariffs are inefficient. You do not need to explain the table. (If I had wanted to make this question harder, I could have asked you to explain the table, or I could have left the table blank and asked you to fill it out.)

Ignoring $Q > E$:	Tariff	No Tariff
consumers pay	IJEG	HBEG
consumers pay to domestic firms	IJEG	HAFG
domestic firm costs = area under the domestic supply curve	ZJEG	ZAFG
domestic firm profit	IJZ	HAZ

3. **[4 points]** When considering a long-run environmental problem such as global warming, would a higher social discount rate make it more likely or less likely that society would undertake costly efforts now to mitigate the problem in the future? Why? Explain your answer using some mathematics.

4. **[5 points]** Illustrate the "part-whole bias" which can be present in contingent valuation analyses. Under what circumstances is it unlikely to be a problem?

. . . continues →

5. **[4 points]** In class, we discussed the difficulties which "disaster aversion" could pose for social decision-makers. We also briefly discussed the "clustering illusion," which is described in detail in a long excerpt continuing on to page 4 of this exam (the excerpt comes from `http://bias123.com/clustering_illusion`, references omitted). Please answer the following question, which we did not discuss in class: How might the "clustering illusion" pose difficulties for social decision-makers trying to figure out how society should respond to environmental problems?

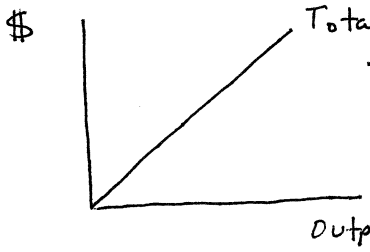
> [...] Gilovich claims that he is able to impress his students by asking them to invent a series of 20 coin flips and also recording a series of 20 actual coin flips, while he waits outside the room. Upon returning he is able tell which series were made up and which were actual coin flips. (The formula is, it's usually the one with the longest streak.)
>
> Why does this happen? ... In a run of 10,000 coin flips, there should be almost exactly 50% of each outcome, without, say, two-thirds of the heads appearing in the first half of the run. The problem is that people expect these same things to be true of 10 coin flips. They expect it to consist of about 5 heads and 5 tails, without too many of the same kind appearing strung together. In fact, mathematically this is quite unlikely.
>
> As a result, people think that they see meaningful patterns where in fact none exist. Making sense out of an ambiguous world is simply a natural part of the human mind, and it is an adaptive tendency that helps us make sense out of the world, this tendency is so automatic that we sometimes infer predictable patterns in streams that are not actually predictable at all.
>
> In sports this tendency has been demonstrated in the widespread belief in streak shooting in professional basketball, the idea that a basketball player will get a "hot hand"... and then successful shots will become more likely (hot hand fallacy). Most basketball fans believe in the hot hand; for instance, 84% responded in the affirmative that "it is important to pass the ball to

someone who has just made several (two, three, four) shots in a row," and 91% thought that a player has "a better chance of making a shot after having just made his last two or three shots than he does after having just missed his last two or three shots." According to a controversial study by Thomas Gilovich, Robert Vallone and Amos Tversky, statistical analysis of the records of basketball teams over the course of the 1980–1981 season... showed that "hot hands" did not exist in the players' records; whether a player would make a shot could not be predicted from the previous throws. If anything, players were very slightly more likely to make a basket after failing on the previous shot.

[...] In another example, Apple changed the shuffle feature for iTunes from a simple randomization to a non-random algorithm in which dissimilar songs were more likely to follow each other, because users complained that shuffling seemed not to work. Steve Jobs was quoted as saying, "We're making it (the shuffle) less random to make it feel more random."

6. **[4 points]** Some economists believe that environmental problems could be solved without government intervention (essentially arguing that if there are any environmental "problems," they are all the fault of governments). In class we discussed some shortcomings of this argument, but for this question I would like you to ignore these shortcomings and give the best argument you can in support of those economists' position. Your answer should involve drawing a graph. The argument you are giving is famous and has a name; you should also state its name.

Answers to Exam 1, Econ 3250, Spring 2016

① 

Straight lines going through the origin in an (x, y) graph  have the form $y = \text{Constant} \cdot x + 0$. So in the TR graph, the equation is $TR = \text{Constant} \cdot q + 0$.

(0 = y-intercept)

It is easy to see that the "constant" must be the item's price: if, for example, $q = 3$ units and $TR = \$18$, then the price must be \$6/unit and $TR = \$6/\text{unit} \cdot 3 \text{ units} + 0$.

("p" = \$6/unit; Constant = \$6/unit; q = 3 units)

So we have $TR = pq$.

(p = constant)

Firms which believe that the price of their output is constant — that is, that the output price is completely outside of the firm's control — are called "perfectly competitive." An example is a wheat farmer in North Dakota: the price of wheat is set in global markets, and one wheat farmer cannot affect the price of wheat. So wheat farmers are examples of "perfectly competitive firms," sometimes abbreviated as "competitive firms." Such firms find it pointless to "compete" against other firms in the ordinary sense of the word "compete," so economists use the term "competition" in a way opposite to the usual meaning of that word. "Competitive" firms find it pointless to engage in marketing on their own behalf, so most firms in a modern economy such as the US are not "competitive." (Farmers sometimes cooperate in large numbers to promote consumption of their crop, but this does not much affect their classification as "competitive.")

(2)

To show that tariffs are inefficient in this simple context, we will show that moving to "No Tariff" can be done in a way that makes everyone better off.

	Move from Tariff to No Tariff
Consumers gain (what they pay ↓)	IJEG − HBEG = IJBH
Domestic firms lose (their profit ↓)	IJZ − HAZ = IJAH

From the graph, IJBH > IJAH. In particular, consumers gain JBA more than domestic firms lose. So a joint policy which moves from "Tariff" to "No Tariff" but which also takes an amount of money greater than IJAH and less than IJBH away from consumers and gives it to domestic firms would make both better off than the "Tariff" policy.

Optional fictional example: IJBH = \$20, IJAH = \$16, JBA = \$4.

Tariff → No Tariff only: Consumers gain \$20, domestic firms lose \$16.

Tariff → No Tariff plus take \$17 away from consumers and give it to domestic firms:

consumers gain \$20 − \$17 = \$3,

domestic firms lose \$16 − \$17 = −\$1, so

domestic firms gain \$1.

"win-win"

Optional: foreign firms are competitive and their marginal cost curve is flat, so their average cost curve is flat, so it's equal to their average revenue curves, so their profit is zero in either case (tariff or no tariff).

(3)

	Benefit of mitigation
Present	a negative number
Future	a positive number

Present Value of "Benefit of Mitigation" =

$$\text{the negative number} + \frac{\text{the positive number}}{(1 + \text{social discount rate})^{\#\text{years in the future}}}$$

If "social discount rate" $\to \infty$, the present value $\to$ the negative number, so mitigation is bad.

As "social discount rate" $\to 0$, the second term of the equation gets more important (gets larger), and might overwhelm the first term, making the present value positive, in which case mitigation would be good.

So the higher the social discount rate, the less likely society would undertake costly efforts now in order to mitigate future problems.

(4)

A contingent-valuation survey of University of Utah students might result in the following:

	How much are you willing to pay to clean up:	Average answer
Randomly chosen group of Univ. of Utah students #1	Lake Huron?	$10
Randomly chosen group of Univ. of Utah students #2	Lake Superior?	$10
Randomly chosen group of Univ. of Utah students #3	both Lake Huron and Lake Superior?	$10, or $12

Lake Huron is <u>part</u> of "Lake Huron and Lake Superior."

Lake Superior is <u>part</u> of "Lake Huron and Lake Superior."

Why doesn't Group #3 value the <u>whole</u> of "Lake Huron and Lake Superior" at about twice the level of the other two groups' single lakes?

Since the Great Lakes are far from Utah, the students might be instead actually answering, "How much would you pay to get a 'warm glow' from helping the environment?" So the three groups feel that they are hearing the same question, and they give roughly the same answer.

This is much less likely to happen with environmental issues that the respondents are very familiar with, for example sites located close to the respondents.

(5)

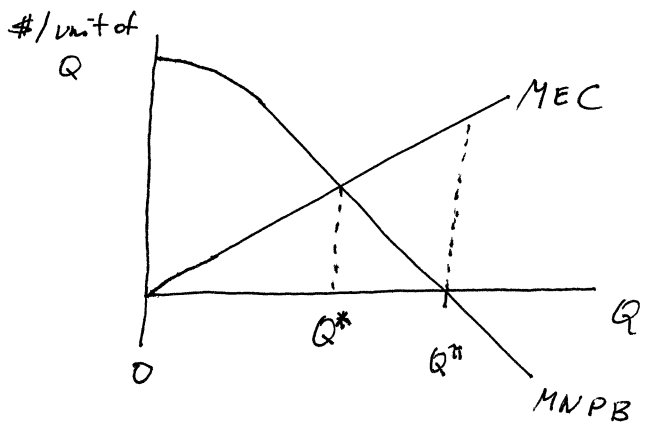
Suppose two similar environmental disasters – two nuclear power plant meltdowns, or two leaks of hazardous chemicals from train derailments, or two well-known species going extinct, for example – occur within a close period of time to each other. The "clustering illusion" could lead people to think that the probability of such events had increased (whereas actually it may have remained the same). Decision-makers would probably respond by spending money to reduce the risk of such disasters, but that would be an over-reaction if the probabilities in actuality had not changed.

[Optional: the probabilities might have changed; it can be hard to tell sometimes.]

On the other hand, one could argue that spending more money is not an over-reaction: if the public is more worried due to the clustering illusion, even if that's not logical, spending more money would make the public feel safer, and maybe the goal is to make the public <u>feel</u> safe, not to make the public <u>be</u> safe. (Or maybe not.)

⑥

This is the Coase Theorem.



MEC: marginal external cost

MNPB: marginal net private benefit

Q: a polluting output

a) If the polluter has the right to pollute, the polluter chooses $Q = Q''$. The pollution victims are willing and able to pay MEC (or below) to reduce pollution (that's the definition of MEC). The firm would be willing to accept a payment above MNPB to reduce Q. So for all $Q > Q^*$, the two parties can make mutually beneficial deals to reduce pollution. Hence Q will end up at Q^*, the socially optimal level, just through bargaining between polluters and their victims.

b) If the pollution victim has the right to stop all pollution, the victim chooses $Q = 0$. The polluter is willing and able to pay MNPB (or below) to pollute. The victim would be willing to accept a payment above MEC to increase Q. So for all $Q < Q^*$, the two parties can make mutually beneficial deals to increase pollution. Hence Q will end up at Q^*, just through bargaining between polluters and their victims.

Optimal: Just because a deal would be mutually beneficial does not actually mean it will occur in the real world.