**Assignment 1**

**Instructions:** Answer each question carefully and show all of your work. You will get **0** points for just writing down the answer. Group work is encouraged, **BUT** each student should turn in their individual homework. This assignment is worth a total of 60 points. This homework includes graphing and problem-solving. If you have any questions, you may contact me. This homework is due on the canvas on Wednesday, **September 15, 2023**. **No email submission and No late submission**.

1. (12 pts)
   1. A friend once remarked that longer movies were a better deal than shorter movies because the ticket price was the same in both cases. Therefore, the longer movie provided more benefits for the same cost as a shorter movie. Using the opportunity cost principle, evaluate your friend's statement.
      1. Your friend may be correct if there are no valuable outside alternatives to watching the movie. In this case, the opportunity cost is the ticket price. A longer movie is thus better because more movie (benefits) for the same opportunity cost.
      2. Alternatively, if there is something else like work or another pastime, then the longer movie is not necessarily better because the opportunity cost now includes forgone earnings/benefits from work that you could be doing during this time. Although with the same ticket price, a longer movie will have a higher opportunity cost.
         1. Shows clear understanding of opp cost concept (cost includes things you could’ve done if not watching the movie) and develops a logical argument for why the friend may be correct or not **[6pts]**
         2. Just uses the words ‘opp cost’ but, does not show understanding **[2pts]**
         3. Award partial credit as you see fit
   2. In 2010, the top-selling pharmaceutical drug in the world was Alerte Ascendre, which is used for the treatment of several common, chronic conditions. The majority of its profits are derived from treatment of the most common diseases, so why does Alerte Ascendre develop drugs for rare diseases instead of investing all of its resources toward drugs for common diseases? Use the marginal principle to briefly explain your answer.
      1. Due to the typo be lenient.
         1. Anything along the lines of: “Because Alerte already covers most common causes there is more to gain from tapping into rare disease markets. Treating one disease could lead to more profit than 3 common so the marginal gain (net marginal profit) is greater for rare diseases.”
         2. Full credit if they show understand of the marginal principle: incremental change and its effect is what should guide decision making. **[6pts]**
         3. Not fully understanding that you should evaluate the *effect* of an incremental change **[3pts]**
         4. Partial credit as you see fit
2. A graph on a grid

   Description automatically generatedSuppose it requires 3 labor hours for the country Technoland to produce 1 apple, and 3 labor hours to produce 1 banana. Country Farmville can produce 1 apple using 5 labor hours and 1 banana using 1 labor hours. Technoland has 1200 labor hours available and Farmville has 800 labor hours. Draw the PPF for Country Technoland. What is the opportunity cost of producing apples in Technoland? What is the opportunity cost of producing bananas in Farmville? Which country has a comparative advantage in apple production? Give a price at which the country explained above would like to trade apples.(12 pts)

*[Answer]*

*First note that Technoland spent all its time on 1 good, then it can produce 400 apples or* *400 bananas. Likewise, Farmville can produce the 160 apples or 800 bananas. The PPFs for* *Technoland is given below. [5 pts. Take off 1 point for each axis not labeled (Apples, bananas). Take off 1 point* *for each wrong intercept (or without number). Take off 1 point if PPF is not straight/linear. Note that the scale will* *probably be off for most students, and that’s okay so long as axes are labeled]*

*For Technoland,*

*• the opportunity cost of apples is 400/400 = 1 banana per apple [2 pt for correct number. -1 pt for not including units]*

*• the opportunity cost of bananas is 400/400 = 1 apple per banana [not asked for but*

*useful]*

*For Farmville*

*• the opportunity cost of apples is 800/160 = 5 bananas per apple [not asked for but useful]*

*• the opportunity cost of bananas is 160/800 = 0.2 apples per banana [2 pt for correct*

*number -1 pt for not including units]*

*Technoland has a comparative advantage in apples. [1 pt. Either right or wrong]*

*Any price between 1 banana per apple and 5 bananas per apple is acceptable. [2 pt. Must actually*

*give a price. -1 points for just saying that it needs to be between opportunity costs]*

*I think the answer for the last question is actually wrong here. It asks the price when “the country above would like to trade apples” – this is unilateral: it asks nothing about the other country, and whether the trade occurs or not. Any price giving more than 1 banana per apple should be correct.*

1. Show your work. Indicate whether the following statement is true or false and justify your answer:  
   (13 pts)  
   There is not a lot of room for partial credit on most of these questions. If a student gets the “true” or “false” correct but provides no justification, I think that should be 0 points. If the student gets the “true” or “false” correct but their justification is wrong, they should get ¼ points. If there reasoning is somewhat correct, ½; correct answer + correct reasoning gets full points.

*I think 0.5 point should be given for a correct T/F without justification. 1 point for a correct answer with justification (even if wrong).*

1. If a country has a comparative advantage in the production of a good, its resources are better suited to the production of that good than are the resources of other countries.  
     
   **False**. [0.5 pt for no justif, 1 pt with justif]

Country A can have the absolute advantage over country B for both goods X and Y, but it cannot have a comparative advantage in both. Say country A has a comparative advantage in X; this means that country B has a comparative advantage in Y, even though its resources are less efficient at producing Y than those of country A.  
  
Key: understand “resources are better suited to the production of that good” means “absolute advantage.” Good answers will be short and to the point; probably no partial credit on this one.

*Arguable. I think “Better suited” is just too vague. We should probably be lenient.*

False [1]

better suited = absolute advantage [1]

absolute advantage != comparative advantage [1]

True [1]

Under trade [1], specializing in goods with comparative advantage are better for both parties/efficient outcome [1]

1. The concave, or bowed-out, shape of the production possibilities curve illustrates the law of decreasing opportunity costs.  
     
   **False**. [0.5~1 pt]

The concave PPF illustrates the law of **increasing** opportunity costs. [1 pt]

If we are only producing good A, we initially face an extremely small opportunity cost to produce B, which shows up as a near-horizontal slope of our PPF. As we move along the curve, the slope grows larger (more vertical), and our opportunity cost increases. As we move close to the point where we are **only** producing good B, our opportunity cost is incredibly high, with a near vertical slope of the PPF. [1 pt]  
  
Full points for correcting “decreasing” to “increasing” and giving an explanation along the lines of the above; key to connect slope to **opportunity cost**. Half credit if get the right answer, but don’t explain the changing opportunity cost along the PPF.

1. A change in the price of carrots will cause a movement along the demand for carrots curve and a shift in the demand for substitute vegetables.  
     
   **True.** [0.5~1 pt]

Assume that the supply of carrots increases (shifts right), so that at any given price more carrots are provided by sellers. This causes a movement **along** the demand curve, to a new (lower) equilibrium price at a new (higher) equilibrium quantity (see figure 1). [1 pt: move along the demand curve because demand is not changed.]

Since the quantity demanded of carrots has increased, the demand curve for substitute vegetables will shift to the left: at any given price, a smaller quantity of substitute vegetables will be demanded since we’re consuming more carrots (see figure 2). [1 pt]  
  
A graph of a price

Description automatically generated A graph of a market

Description automatically generated  
  
  
I don’t like the wording on this question: the change in price is the **outcome** of the process, not the cause of it. Students may reasonably interpret “a change in the price of carrots” as a shift to a new equilibrium price; this may be caused by supply-side or demand-side factors. I think the question would be better stated: “A supply side shock causes a movement along the demand curve, and a shift in the demand curve for substitute vegetables.” In which case the above is true.  
  
Be lenient on this one if it seems like they did not understand the question. Good answers will clearly state the chain of events: supply curve shifts 🡪 movement along demand curve 🡪 shift in the demand curve for substitutes. A graph is nice, but I don’t think is necessary for full credit.

1. Whenever supply decreases and demand increases, both price and quantity necessarily increase (4pts)  
     
   **False**. [0.5~1 pt]  
     
   Say supply decreases while demand is unchanged. We know that the equilibrium price will increase, and the equilibrium quantity will decrease.  
     
   Now say demand increases, while supply is unchanged. We know that the new equilibrium price will be higher, and the equilibrium quantity will increase.  
     
   Under both scenarios the price increases, and so when both happen simultaneously, the equilibrium price increase [1pt]. However, the effect on quantity is ambiguous: the supply shift drives it down, while the demand shift drives it up. Which of these forces wins out is an empirical question (we need to measure it). Figures 3 and 4 give two visual examples of how the size of each shift determines the outcome: in both cases the price rises, but the direction of the change in equilibrium quantity varies [2 pt: ambiguous due to countervailing forces].  
     
   A drawing of a line

   Description automatically generated A diagram of a graph

   Description automatically generated  
   Correct answer will identify the countervailing forces on both outcomes: supply and demand shifts both move the price up, but ambiguous effects on quantity. They can get half credit if they show correct reasoning for the one of the effects, but misunderstand the other.
2. **Graphs: For each of the questions below** *(1)* **use a graph to demonstrate the shifts in the supply/demand curves and** *(2)* **write the change in the equilibrium price and quantity in the space provided. (14 pts)**

**[For future assignments/exams, be sure to explain briefly why curves shift: i.e., refer to PESTS and TRIBE]**

1. Consider the market for Domino’s pizza.  Illustrate how an increase in the price of tomato sauce would affect the Domino’s Pizza market.

Graph the decrease in Domino’s supply [1pt]

State that eqm price increases [1 pt]

State that eqm quantity decreases [1pt]

1. Consider the market for Pepsi.  Illustrate how a decrease in the price of Coke would affect the Pepsi market.

Graph the decrease in Pepsi demand [1pt]

State that eqm price decreases [1 pt]

State that eqm quantity decreases [1pt]

1. What will happen to the market for peanut butter if (1) the peanut crop is devastated by disease and (2) the price of grape jelly rises.

Graph the decrease in supply and increase in demand [2pts, 1 point per each]

State that eqm price unambiguously increases [1 pts]

State that the change in eqm quantity in the market is ambiguous [1pts]

If complements, decrease in demand

P ambig [1]; Q decrease [1]

1. Consider the market for iPods. What happens if a fantastic new alternative MP3 player is developed and, at the same time, a boat carrying a large shipment of iPods is attacked by sea monsters and sunk?

Graph the decrease in supply and demand [2pts, 1 point per each]

State that the change in price is ambiguous, since it depends on the magnitude of shift [1 pts]

State that the quantity in the market unambiguously decreases [1pt]

1. The supply and demand for solar panels are given by QS = 5P – 5,000 and QD = 15,000 – 5P, where P is the price per solar panel and Q measures the quantity of solar panels. Calculate the equilibrium price and quantity of Solar panels. At what price will there be 20 units of surplus? Show your work.

(9 pts)

*Q\_d = Q\_s*

*15000 – 5P = 5P -5000*

*20000 = 10 P*

*P = 2000*

*Plug into either supply or demand*

*Q\_d = 15000 – 5(2000) = 5000*

*Q\_s = 5(2000) – 5000 = 5000*

*Surplus occurs when Q\_s > Q\_d*

*Q\_s – Q\_d = 20*

*5P – 5000 – (15000 – 5P) = 20*

*10 P – 20000 = 20*

*10 P = 20020*

*P = 2002*

*At price of 2002 dollars per unit, there will be a surplus of 20 units*

*[1 pt for Q\_s = Q\_d]*

*[2 pt for P =2000]*

*[2 pt for Q = 5000]*

*[2 pt for Q\_s - Q\_d = 20, can give 1 point partial credit if they say a surplus means*

*Q\_s > Q\_d or that P must be higher than 2000]*

*[2 pt for P=2002]*