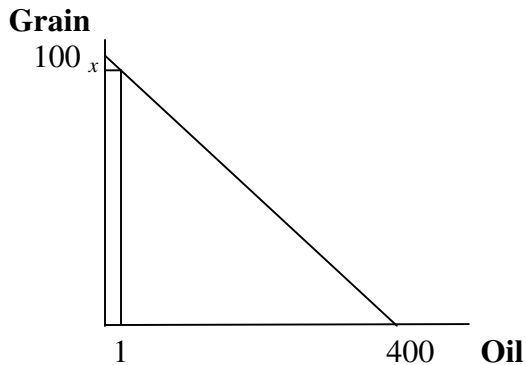


For the mathematical questions, please indicate your answer as succinctly as possible. For the verbal (descriptive) questions, please do not exceed one standard paragraph in length (no more than 150 words...answers significantly exceeding this length may not be counted).

Question 1

Consider the PPF of Kazakhstan depicted below.



Imagine that Kazakhstan can produce one unit of grain with one worker, or four units of oil with one worker.

- How many workers does Kazakhstan have?
- How many workers does Kazakhstan require to produce one unit of grain? Of oil?
- What is the opportunity cost for Kazakhstan of producing one unit of oil?
- What is the opportunity cost for Kazakhstan of producing one unit of grain?
- If Kazakhstan is producing one unit of oil, what is the most amount of grain they can produce given their available resources (that is, what is the value of x in the PPF above?)

Question 2

Now imagine that another country, Uzbekistan can produce four units of grain with one worker and six units of oil with one worker. Also, imagine that Uzbekistan has 100 workers. (note: it may be helpful for you to draw the PPF of Uzbekistan)

- What is the opportunity cost for Uzbekistan of producing one unit of oil?
- What is the opportunity cost for Uzbekistan of producing one unit of grain?
- Between Kazakhstan and Uzbekistan, who has the absolute advantage in producing grain? In producing oil?
- Between Kazakhstan and Uzbekistan, who has the comparative advantage in producing grain? In producing oil? If there are mutually beneficial gains from trade, which product should each country specialize in?

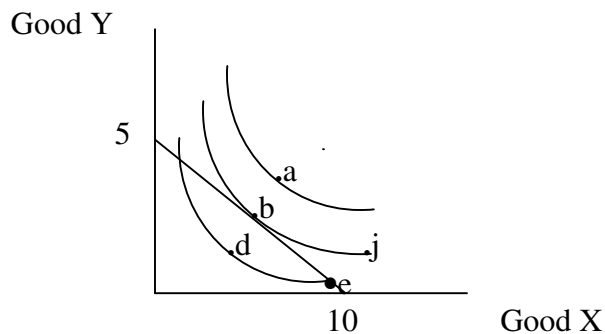
- e.) If the price of oil is 1/2 unit of grain (and the price of grain is two units of oil), can Kazakhstan and Uzbekistan gain from trade? Explain by giving an example where each country consumes a bundle of grain and oil that is unattainable without trade (that is, to the right of the PPF).
- f.) What is the lowest price of one unit of oil that Kazakhstan is willing to accept in a trade? What is the highest price of one unit of oil that Uzbekistan is willing to pay in a trade?
- g.) What is the lowest price of one unit of grain that Uzbekistan is willing to accept in a trade? What is the highest price of one unit of grain that Kazakhstan is willing to pay in a trade?

Question 3

A recent article (see attached) in *The Plain Dealer* discussed an apparent paradox: in the market for berries, both supply and demand are high, yet the price is also up. Reconcile this fact with the details provided in the article and with what you know about the supply and demand model. Use graphs and words in your answer. (hint: see page 27 of the lecture notes)

Question 4

Consider the diagram below that depicts a consumer's budget line and three indifference curves. Imagine the price of good Y is \$2 and the price of good X is \$1.



- a.) How much income does this consumer have?
- b.) The consumer is maximizing his utility subject to his budget constraint at point b. Explain why he is not maximizing subject to constraints at either points a, d or e.
- c.) Can you find another bundle that if the consumer consumed would make her indifferent from consuming the bundle at point b? Why doesn't the consumer choose this point?
- d.) Why could indifference curves be bowed inwards?
- e.) Some other types of curves are bowed outwards. Name one such curve we discussed that is bowed outwards and explain why. Also, explain how the reason the type of curve you discuss is bowed outwards is related to the reason indifference curves are bowed inwards.

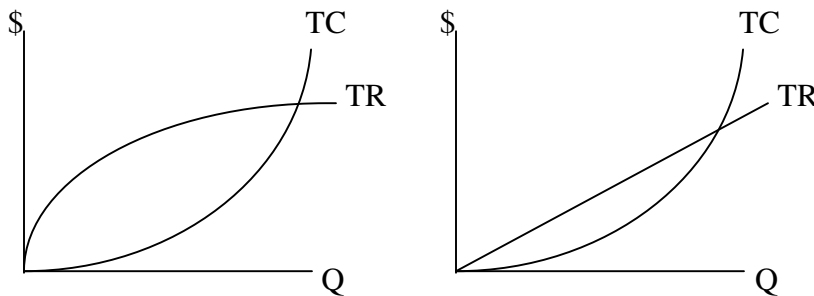
Question 5

This question is about production and costs

- If marginal cost is below average total cost, average total cost must be (increasing/decreasing)
- If marginal cost is above average total cost, average total cost must be (increasing/decreasing)
- In a competitive market with identical firms, equilibrium price will be equal to marginal cost which will be equal to the minimum of average total cost ($P = MC = \min ATC$) in the short-run. If a competitive market is in equilibrium and then demand increases, what will happen to price in the short run? What will happen in the market in the long run? What does the long-run supply curve look like?
- How would the long-run supply curve look if firms were not identical, but had different costs?

Question 6

Below are two models of revenues and (explicit) costs for hypothetical firms:



- What is the main difference between these two graphs?
- As a model, why might some economists prefer to analyze the second graph?
- If the firm can choose its quantity freely, describe qualitatively which quantity maximizes their profits in each graph, where profit = $TR - TC$? (e.g. is it where the TR and TC curves intersect?)

Question 7

Draw a supply and demand diagram, labeling the curves and both the x-axis and y-axis correctly. Then, indicate the equilibrium point and describe why it is an equilibrium, e.g. why are prices associated with other points not consistent with an equilibrium?