

Gains from Trade

- I. Consider the following hypothetical domestic demand curve for a particular product (that is, the demand for the product by people in the United States).

$$\text{Domestic Demand } D_D: P = 20 - 2Q$$

Consider also the following domestic supply curve (the supply from United States producers, to U.S. consumers).

$$\text{Domestic Supply } S_D: P = 5 + Q$$

- a. Sketch the domestic supply and demand curves. Label all curves. Indicate on the vertical axis the value of the y-intercept for each equation. Label the origin 0.



- b. Using the above equations find the equilibrium price and quantity if there is no trade. (Hint: Since in equilibrium, the price from the demand curve must be the same as the price from the supply curve, you can set them to be equal. That is, $20 - 2Q = 5 + Q$. Solve this equation for the equilibrium quantity Q . Then plug the Q value you found into either the demand or supply equation to determine the equilibrium price.)
- c. Show the value calculated in part (b) for equilibrium price on the vertical axis of your graph in part (a) and the value calculated for equilibrium quantity on the horizontal axis.
- d. The areas represented by consumer surplus and producer surplus in this problem are triangles. The area of a triangle is calculated as $(1/2)(\text{base})(\text{height})$. Calculate consumer surplus and producer surplus using this formula.

- II. Consider now the following total supply curve to the United States. (This is the supply to the United States consumers by foreign and domestic producers).

$$\text{Total Supply } S_T: P = 5 + .5Q$$

- a. Show this curve on the same graph you sketched above. Label the curve and the y-intercept.
- b. Using the total supply curve and the domestic demand curve, find the equilibrium price and quantity if there is trade.
- c. On your graph drawn in part Ia, show the equilibrium price on the vertical axis and the equilibrium quantity on the horizontal axis.
- d. The quantity calculated in part (b) above is the total quantity supplied to the U.S. by domestic and foreign producers combined. Use the equation for the domestic supply curve to determine the quantity supplied to the U.S. by domestic producers, at the price calculated in part (b).
- e. Show the quantity supplied to the U.S. by domestic producers (from part d), on the horizontal axis of the graph in Ia.
- f. Using the total supply to the U.S. (from part b) and the domestic supply to the U.S. (from part d), what must be the quantity supplied to the U.S. by foreign producers at the price in (b)?
- g. Calculate the consumer surplus and the producer surplus (for U.S. consumers and U.S. producers only). [Note: the producer surplus is the area above the domestic supply curve and below the free-trade price.]

III. Compare the free trade situation from part II with the no trade situation from part I, by answering the following questions.

- a. Is the free-trade U.S. consumer surplus larger or smaller than the no-trade U.S. consumer surplus? _____
- b. What is the gain or loss in the amount of U.S. consumer surplus from trade compared to no trade? _____
- c. Is the free-trade U.S. producer surplus larger or smaller than the no-trade producer surplus? _____
- d. What is the gain or loss in the amount of U.S. producer surplus from trade compared to no trade? _____
- e. What is the net gain to all U.S. citizens, consumers and producers, from free trade compared to no trade?
(Net gain equals gains minus losses.) _____