

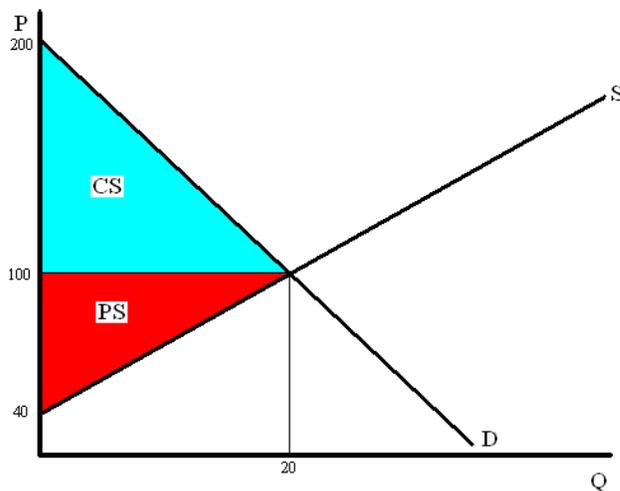
**Problem 1:**

In Schulzland, a small closed economy, the supply and demand for bushels of peanuts are given by **D:  $P = 200 - 5Q$**  and **S:  $P = 40 + 3Q$** . The world price of peanuts is \$70 per bushel.

a) Find the equilibrium price and quantity when the economy is closed.

*Setting our S & D equations equal to each other, we have:  
 $200 - 5Q = 40 + 3Q$ , so  $160 = 8Q$ , so  $Q^* = 20$ ,  $P^* = 100$*

b) Graph the domestic supply and demand curves for peanuts in Schulzland. Calculate the total consumer and producer surplus in the domestic market and label the appropriate areas on the graph.



*To calculate CS and PS, we simply find the area of the above triangles:*

$$CS = (1/2) * 100 * 20 = \$1000$$

$$PS = (1/2) * 60 * 20 = \$600$$

c) Now Schulzland opens to trade. Find the quantity demanded and supplied domestically. What is the total quantity of imports?

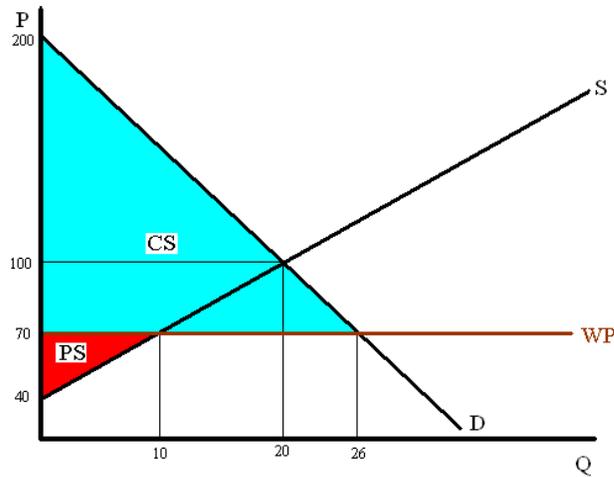
*At WP = 70, we can simply plug this price into our D & S curves to find the quantities supplied and demanded domestically. Thus we have:*

$$70 = 200 - 5Q^D, \text{ so } 130 = 5Q^D, \text{ so } Q^D = 26.$$

$$70 = 40 + 3Q^S, \text{ so } 30 = 3Q^S, \text{ so } Q^S = 10.$$

*Therefore, the total volume of imports is  $26 - 10 = 16$ .*

d) Graph the newly opened economy by adding the world price to the domestic supply and demand curves. Calculate the total consumer and producer surplus under free trade and label the appropriate areas on the graph.



Again, we need only find the areas of these triangles to find CS and PS.

$$CS = (1/2) * 130 * 26 = \$1690$$

$$PS = (1/2) * 30 * 10 = \$150$$

e) Domestic peanut producers, upset by the new trade policy, lobby President Charles to protect their industry by imposing a tariff of \$15 per imported bushel of peanuts. Find the new quantity of imports.

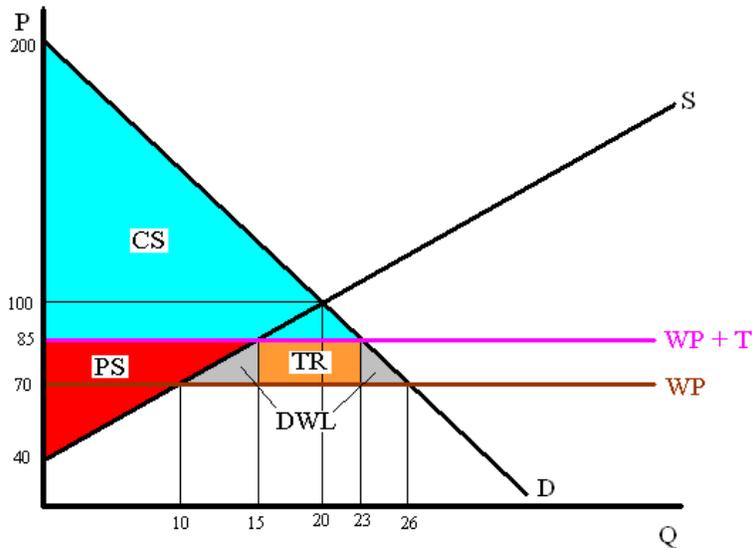
With the tariff, we have  $WP + T = \$85$ , and we can plug this value into our S & D eqns.

$$85 = 200 - 5Q_{DT}, \text{ so } 115 = 5Q_{DT}, \text{ so } Q_{DT} = 23.$$

$$85 = 40 + 3Q_{ST}, \text{ so } 45 = 3Q_{ST}, \text{ so } Q_{ST} = 15.$$

Therefore, the total quantity of imports is  $23 - 15 = 8$ .

f) Graph the effects of the new tariff on the peanut market. Calculate the new consumer and producer surplus, the revenue raised by the tariff, and the deadweight loss imposed on the market. Label the appropriate areas on the graph.



Tariff revenue is the orange rectangle, while DWL is the two small grey triangles. We compute each quantity as follows:

$$CS = (1/2) * 115 * 23 = \$1322.50$$

$$PS = (1/2) * 45 * 15 = \$337.50$$

$$TR = 15 * 8 = \$120$$

$$DWL = (1/2) * 15 * 5 + (1/2) * 15 * 3 = \$37.50 + \$22.50 = \$60$$

g) President Charles is defeated in the next election by Senator Van Pelt, who promised during her campaign to repeal the peanut tariff. Instead of the tariff, the new President Van Pelt decides to impose a quota of 20 bushels on peanut imports. Find the new equilibrium price and quantity (hint: drawing the graph first may help). What is the total value of the quota rents? Why?

Under free trade, consumers only want to import 16 units (from part c). Therefore, if the quota is set at 20, the quota will have no effect on the market relative to the free trade case, as consumers do not wish to import more than 20 units. So the equilibrium price and quantity in the market will be the same as in the free trade case ( $P^* = 70$ ,  $Q^* = 26$ ). And since not all the quota licenses get used, the value of a quota license will be \$0, so there are no quota rents in this economy.

### Problem 2:

Describe whether the following events count as part of American GDP

a) Tropicana buys oranges to make orange juice.

*Does not count as part of GDP, as the oranges are an intermediate good.*

b) Shelley buys a Toyota which was produced in Japan.

*The Toyota was not produced in the US, so it does not count in US GDP.*

c) Chris purchases a jar of peanut butter, which he uses to make sandwiches for his own consumption.

*This is a final good, so it does count as part of GDP (consumption)*

d) James buys a used couch from Goodwill.

*The couch is not a new good, so it does not count as part of GDP.*

**Problem 3:**

Consider an economy with three firms. Diggers, Inc. produces clay from its mining operations; Bakers, LLC buys the clay and makes it into bricks; Builders Corp. buys the bricks and constructs homes. Bakers can get enough clay from Diggers to make 1 brick for \$5, and Builders buys the bricks from Bakers for \$8 each. Every house sold by Builders contains 10,000 bricks and sells for \$100,000.

a) What is the total value added by each firm in the production of 1 house?

*We need to compute the price of intermediate goods to determine how much value added each firm contributes. Recalling that every house has 10,000 bricks, we have:*

*Diggers – no intermediate goods used, so all output is value-added. Total Value Added:  $\$5 * 10,000 = \$50,000$ .*

*Bakers – buy \$50,000 worth of clay from Diggers, sell 10,000 bricks at \$8 each. Total Value Added:  $\$8 * 10,000 - \$50,000 = \$30,000$*

*Builders – buy \$80,000 worth of bricks from Bakers, sell the house for \$100,000. Total Value Added:  $\$100,000 - \$80,000 = \$20,000$ .*

b) Use the information above to fill in the following table:

	Diggers Inc.	Bakers, LLC	Builders Corp.
Wages	\$35,000	\$10,000	\$15,000
Rent	\$5000	\$6500	\$4000
Cost of Intermediate Goods	\$0	\$50000	\$80,000
Profits	\$10,000	\$3500	\$1000

*The cost of intermediate goods is taken from the answers to a). Since we know the total revenue of each firm (also from part a - \$50,000 for Diggers, \$80,000 for Bakers, \$100,000 for Builders), we know that each column must sum to the total revenue, so we can simply subtract the sum of the top three columns from the total revenue to find the profits for each firm.*

**Problem 4:**

In a letter to the *Wall Street Journal* in 1990, Senator Ernest Hollings wrote that “[C]onsumers do not benefit from lower-priced imports. Glance through some mail-

order catalogs and you'll see that consumers pay exactly the same price for clothing whether it is US-made or imported." Is the Senator correct? Explain your answer.

*The Senator is very much incorrect. The prices in the magazines will be the same for domestic and internationally produced items because the presence of the imports forces some domestic producers out of business – specifically, those who cannot produce at costs lower than the world price. However, if we compare this price in the magazine to the price consumers would pay without trade, we would find that it is lower than the closed economy price. So consumers do benefit from lower priced imports once we make the correct comparison, as the lower price increases consumer surplus.*

**Problem 5:**

Consider an economy with a population of 1,000,000. Of these, 150,000 are either too old or too young to work, 600,000 have jobs, 50,000 do not have jobs and are not currently looking for employment, and 200,000 do not have jobs and are actively looking for employment.

a) How many people are in the labor force in this economy?

*The labor force does not include those who are too old or too young to work, nor does it include discouraged workers. So the labor force here is the sum of the employed and unemployed (but looking for work) groups, and  $600,000 + 200,000 = 800,000$ .*

b) What is the unemployment rate?

*The unemployment rate is given by*

*Unemployment rate = (Number of unemployed) / (Number of unemployed + number of employed), so we have*

$$\text{Unemployment rate} = 200,000 / (200,000 + 600,000) = 25\%.$$