

**Homework #3**

**Problem 1:** Suppose the market demand and supply curves for mead are given by the equations  $Q_D = 38 - 3 \cdot P$  and  $Q_S = P - 2$ .

- (1) Solve for the equilibrium price and quantity. Graph your results. Shade in the areas that represent consumer and producer surplus.
- (2) Government officials fear that too much mead is being consumed at the market equilibrium, leading to concerns about health and safety of the populace. In response the government imposes an excise tax of \$2 on the producers of mead.
  - a. Calculate the new equilibrium prices and quantity. Plot the new equilibrium on your graph and label consumer surplus, producer surplus, and tax revenues. Was the tax effective in reducing the quantity of mead consumed? What is the incidence of the tax on consumers and producers?
  - b. Complete the following table with quantities:

	No Tax	\$2 Unit Tax	Change
Consumer Surplus			
Producer Surplus			
Tax Revenue			
Total Welfare			

- c. Suppose that the level of mead consumption at the no tax equilibrium really was a health and safety problem in that it required the government, or those other than mead producers or consumers, to spend more for healthcare, police, and corrections. Do these costs enter into the welfare calculations in your table in part b.? If not, should they?

**Problem 2:** Consider the market for potatoes with inverse demand given by  $P = 30 - 2 \cdot Q_D$  and inverse supply given by  $P = 10 + 2 \cdot Q_S$ . Now suppose the government implements a price subsidy program instead of the price support program. Let the government target price be \$24.

- (1) Calculate the equilibrium price and quantity. Draw a graph and label the equilibrium price and quantity.
- (2) The government is concerned about potato farmers' ability to earn adequate income from farming potatoes and decides to implement a price support policy whereby a price floor of \$24 will be set in the market for potatoes and the government will purchase and destroy the surplus potatoes at a price of \$24.
  - a. Calculate the price of exchange, quantity exchanged in the marketplace, and the amount of potatoes purchased and destroyed by the government.
  - b. On your graph from part (1) shade in and label areas that represent consumer surplus, producer surplus, and government expenditures under the price floor policy. Can you identify the deadweight loss (DWL)? (**Hint:** it isn't a triangle).

(problem continues)

- c. Complete the following table with quantities. What is the deadweight loss resulting from the price support?

	No Price Floor	Price Floor of \$24	Change
Consumer Surplus			
Producer Surplus			
Government Revenue			
Total Welfare			

- (3) The government is concerned about high cost of the price support policy described in part (2) and is considering doing away with said policy and implementing a unit subsidy (paid to the farmers) that will ensure that farmers receive a price (after the subsidy) of \$24 for their potatoes.
- How large does the subsidy need to be? (**Hint:** the incidence formula applies to subsidies).
  - Under the subsidy from part (3)a. calculate the equilibrium prices and quantity. What is the price of exchange? On a new graph label the original equilibrium and the post subsidy equilibrium prices and quantities. Shade in the regions that represent consumer surplus, producer surplus, government expenditures, and DWL under the subsidy program.
  - Complete the following table with quantities. What is the deadweight loss resulting from the subsidy? Is the subsidy better than the price support?

	No Subsidy	Subsidy	Change
Consumer Surplus			
Producer Surplus			
Government Revenue			
Total Welfare			