

## ECONS 301 – Homework #1

**Due date:** Tuesday, September 6<sup>th</sup> 2016, in class.

**Exercise #1 (Supply and demand).** Suppose that the demand and supply for milk in the European Union (EU) is given by

$$p = 120 - 0.7Q^d \text{ and } p = 3 + 0.2Q^s$$

where the quantity is in millions of liters and the price is in cents per liter. Assume that the EU does not import or export milk.

- Find the market equilibrium quantity, and the equilibrium price.
- Find the consumer and producer surplus at the market equilibrium that you found in part (a).
- Assume now that European farmers successfully lobby for a price floor of 36 cents per liter. What is the new quantity sold in the market?
- Find the consumer and producer surplus after the price floor.
- What is the deadweight loss from introducing the price floor?
- If the EU authorities were to buy the surplus milk from farmers at the price floor of 36 cents per liter, how much would they spend in millions of euros? [Recall that 1 Euro=100 cents.]

**Exercise #2 (Indifference curves and MRS).** For each of the following utility functions, find the marginal rate of substitution function,  $MRS$ , and plot the indifference curve for which the consumer reaches a utility level of  $u = 10$ .

- $u(x_1, x_2) = x_1 x_2$
- $u(x_1, x_2) = 2x_2$
- $u(x_1, x_2) = x_1 + x_2$
- $u(x_1, x_2) = \min\{x_1, 2x_2\}$
- $u(x_1, x_2) = x_2 + x_1^2$