Homework 4
ECON 300.01
Due Date: **by 4pm** on Friday, November 30th, 2012
32 Points
**Turn your homework into the economics office and make sure they time
stamp it**

1. (6 points) Suppose that a firm faces a demand curve of $D(P) = 600 - 10P$.
The firm's short-run total cost curve is $STC(q) = 49 + 2q + q^2$ and its marginal
cost curve is $SMC(q) = 2 + 2q$.
 In the short-run, there are 20 identical firms in the industry.
 a) Find the market price, firm's quantity, and market (industry) quantity
 in the short-run.
 b) Find profit for the firm. Does the firm make a positive, negative, or
 zero profit?

2. (6 points) Assume that:
Each individual firm's costs are:$C = 35 + q^2$ and $MC = 2q$.
Market demand is: $Q = 45 - P$
Industry output is: $Q = n * q$, where $n = \#$ of firms.
 a) What is the output per firm?
 b) What is the equilibrium number of firms in the industry?
 c) What is the equilibrium price?

3. (6 points) Assume all firms in the candy industry face the same cost
structure. Each firm faces costs, $C = 0.03q^2 - q + 50$, $MC = 0.06q - 1$, where
$q = \#$ of candies sold per day.
 a) In a long-run equilibrium, how much is each candy store producing?
 b) Let the market demand for candy equal $Q_d = 2,500,500 - 250,000P$
 What is the equilibrium price and quantity in the long-run?
 c) What is the equilibrium number of candy stores in the long run?

5. (8 points) The inverse demand curve a monopoly faces is $P = 100 - Q$.
The firms cost curve is $C = 10 + 5Q$. Note, the firm's $MR = 100 - 2Q$ and
$MC = 5$.
 a) What is the firm's profit maximizing solution (price AND quantity)?
 b) What is the firm's economic profit?
 c) Graph the marginal revenue, marginal cost, and demand curves, and show
the area that represents deadweight loss on the graph.
 d) How does your answer to a) and b) change if $C = 100 + 5Q$.

6. (6 points) (Review for final)
 All the workers in a factory have the same utility function $U = x_1x_2$, earn
the same income of 10 and face the same prices $p_1 = 1$ and $p_2 = 1$. Their
marginal utilities are: $MU_{x_1} = x_2$ and $MU_{x_2} = x_1$.
 a) What is the optimal consumption bundle for each worker? What utility

do they obtain?

b) Graph the indifference curve that goes through the optimal consumption bundle. In the same graph draw the budget set.

c) What is the total demand of good x_1 and x_2 if there are 10 workers in the factory?