The Digital Economist

Intermediate Microeconomics
Worksheet #5: **Competitive Behavior**   Name:_____

1. Given the following **T**otal **R**evenue, **T**otal **C**ost, and Profit '**P**' functions:

    $$TR = 22Q - 2Q^2$$
    $$TC = 24 + 6Q$$
    $$P = TR - TC$$

    a. Derive the *marginal revenue* and *marginal cost* functions.

    b. What is the profit maximizing level of output '**Q**'?

    c. Find the breakeven points for this firm by factoring the profit function.

2. Complete the following table (assume Perfect Competition)

Q	FC	VC	TC	ATC	AVC	MC	P	TR	MR	**P** *or Loss*
3	20	100					$30.00			
4		120								
5		130								
6		136								
7		155								
8		188								
9		250								
10		330								
11		425								
12		535								

   a. Under conditions of perfect competition, what is the profit-maximizing level of output?

b. In the Long Run, will firms enter or exit this industry? Explain why.

c. What level of output defines the long run equilibrium for this particular firm?

3. Given the following equations:

   $P = 100 - 10Q$ {Inverse Demand}
   $VC = 20Q$ {variable costs}
   $FC = 50$ {fixed costs}

a. Derive the Total Revenue (TR), Total Cost (TC), Average Total Cost (ATC), Marginal Revenue (MR), and Marginal Cost (MC) functions.

b. What is the (unregulated) profit-maximizing price and level of output?

c. What are the level of profits in this case?

d. What is the dead-weight loss associated with this type of behavior?

e. If the firm were to be regulated, what would be the corresponding regulated price and level of output? Explain.

f. What are the level of profits to the firm under regulation? Discuss your answer.

4. Given the following equations:

$P = 100 - 10Q$ --   *Inverse Demand*
$MR = 100 - 20Q$ --   *Marginal Revenue*
$MC = 20$ --   *Marginal Costs*
$TC = 20Q$ --   *Total Costs*

a. Compute the *profit maximizing* level of output and corresponding price.

b. What are the level of profits associated with this *profit maximizing* level of output?

c. What is the level of output for a monopolist under *First-Degree Price Discrimination*?

d. What are the corresponding profits under *First-Degree Price Discrimination*?

e. What is the *Welfare Loss* associated with *profit maximizing* behavior. How about with *First-Degree Price Discrimination*?