ECON 433

Quiz 2

Dr. Kevin Hasker

1. *(2 Points)* Please read and sign the following statement:

   I promise that my answers to this test are based on my own work without reference to any notes, books, or the assistance of any other person during the test. I will also not assit others nor use any electronic device during this test.

   Name and Surname: _

   Student ID: _

   Signature:

   _

2. *(6 points)* Write down a reason for a natural monopoly, explain, and give an example of an industry with this characteristic. **NOTE:** If you write down several you will still only be graded on the first one you write down.

   Remark 1 *For grading, first of all as stated only grade their first answer. Second in brief the name is worth a point and the explanation two, the example is worth the final point. If they get the name mixed up a bit be leniant.*

   The four factors are:

   (a) *Small markets—the marketplace is just too small to have competition. Modern day examples of this are very rare, however before free trade examples like car production are excellent. Most countries had a car producer even if they were very small. Modern day one could talk about commercial airplanes. Even though it is a duopoly it should be fine. (Notice this one it is almost impossible to given modern examples of.)*

   (b) *Always decreasing average costs—if the average costs are always decreasing then marginal costs will always be lower than average costs and a market cannot be competitive. Modern examples would be the software industry, since almost all their money is spent on research and development.*

   (c) *Network externalities—goods like languages where the marginal utility of using the good is increasing in the number of other users. Operating systems or the like are excellent modern examples.*

   (d) *Economies of the marketplace—naturally there should only be one market. After all buyers want to go where the most sellers are and vice-versa. This explains why globally Amazon and Ali-baba have essentially a complete lock on online sales. Though there are frequent entrants.*

3. *(12 points total)* A monopolist faces the demand curve:

$$Q = 28 - 2P$$

and has constant marginal costs $C(Q) = 6Q$

Remark 2 *In this question methodology is all. If they don't set up the right obejctive function and show their work they should get no credit.*

(a) *(3 points)* Noticing that for a firm with constant marginal costs profits are $(P - c)Q$ where c is the constant marginal cost, set up the objective function of this monopolist maximizing their profits over price:

$$(P - 6)(28 - 2P)$$

(b) *(4 points)* Find the first order condition of this firm, then the monopoly price and the quantity that will be demanded.

$$\begin{aligned} (28 - 2P) - 2(P - 6) &= 0 \\ P &= 10 \\ Q &= 28 - 2(10) = 8 \end{aligned}$$

(c) *(1 points)* Now set up the profit funciont of monopolist maximizing their profits over quantity.

$$\begin{aligned} Q &= 28 - 2P \\ P &= 14 - \frac{1}{2}Q \end{aligned}$$

$$\left(14 - \frac{1}{2}Q\right)Q - 6Q$$

(d) *(4 points)* Find the first order conditions of this firm, then the monopoly quantity and price the firm will set. Notice that the answers to part b and part d are the same.

$$\begin{aligned} \left(14 - \frac{1}{2}Q\right) - \frac{1}{2}Q - 6 &= 0 \\ Q &= 8 \\ P &= 14 - \frac{1}{2}(8) = 10 \end{aligned}$$