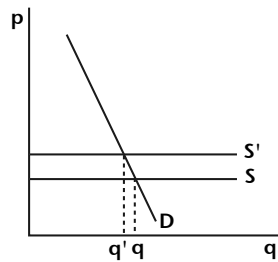


ECON 110, Prof. Hogendorn

Problem Set 2 Answers

1. *Healthcare\_a.*

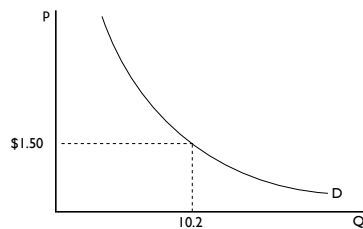
- (a) Healthcare has very few substitutes because sick people have very limited alternatives. The only source of any elasticity is people delaying elective and preventive care and the poorest people going without care altogether.
- (b) Supply must be horizontal and it must intersect the demand curve below its midpoint.



- (c) Higher costs in the industry shift the supply curve up. At the new equilibrium, the percentage increase in price is greater than the percentage increase in supply due to the fact that demand is inelastic.

2. *Tokens3\_a.*

- (a) The graph is:



$$(b) \epsilon_p = \frac{dt}{dp_t} \frac{p_t}{t(p_t)} = -8.93 p_t^{-5/3} \frac{p_t}{13.39 p_t^{-2/3}} = -0.66 \frac{p_t^{-2/3}}{p_t^{-2/3}} = -0.66$$

This should be no surprise since this is a constant elasticity demand curve with an exponent of  $-2/3$ .

- (c) Since we know that the demand is inelastic, the 33% rise in price will result in a less-than-33% decrease in quantity. Therefore the revenue must rise, since revenue is just price times quantity. If you calculated it out, the revenue was \$15.32 before and \$16.87 after.

### 3. Accord\_a.

(a)

$$\begin{aligned} \epsilon &= \left| \frac{dq}{dp} \frac{p}{q} \right| \\ 4.798 &= \frac{dq}{dp} \frac{17445}{40} \\ 0.011 &= \frac{dq}{dp} \end{aligned}$$

If we approximate using linear demand  $q = a - bp$ ,

$$\begin{aligned} b &= 0.011 \\ a - b17445 &= 40 \\ a &= 231.895 \end{aligned}$$

- (b) The new price is 16945, so the new quantity is

$$231.895 - 0.011 \cdot 16945 = 45.5$$

Then the change in revenue is:

$$16945 \cdot 45.5 - 17445 \cdot 40 = 770997.5 - 697800 = 73197.5$$

- (c) Since the Accord is just one particular type of car, there are many close substitutes available to consumers. Then even a small percentage reduction in the price of the Accord will bring in a large percentage increase in the quantity purchased. In general, the more broadly one defines a "good," the lower the price elasticity. E.g. Accords have a higher elasticity than mid-size cars, which in turn have higher elasticity than all cars, which in turn have higher elasticity than all vehicles, etc.

#### 4. *Juvenor\_a.*

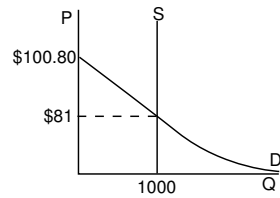
- (a) Amherst Guy (AG) added the *inverse* demand curves, which means he added a price plus a price. This makes no sense. The right way to do it is to add the quantities as a function of price:

$$\begin{aligned}q^{men} &= 5000 - 50p \\q^{women} &= 4000p^{-1} \\q^{market} &= 5000 - 50p + 4000p^{-1}\end{aligned}$$

- (b) AG set supply in terms of quantity equal to demand in terms of price. Now that we have demand in terms of quantity from (a), we can find the correct equilibrium price:

$$\begin{aligned}s(p) &= q(p) \\1000 &= 5000 - 50p + 4000p^{-1} \\0 &= 4000 - 50p + 4000p^{-1} \\0 &= 4000p - 50p^2 + 4000 \\p &= 81\end{aligned}$$

- (c) AG's graph was wrong for two reasons. Less important, it was based on his incorrect demand curve. More important, we know that supply is perfectly inelastic, but he drew it as elastic. The correct graph is:



- (d) AG found CS by taking the entire area under the demand curve, but only the area under demand and above the price is surplus to the consumer. It's typically easier to integrate with respect to price to find this area:

$$\int_{81}^{100.8} 5000 - 50p + 4000p^{-1} dp$$

(Note that this demand curve does have a choke price of 100.8.)