

## SECTION NOTES 3

Covering material from Lecture on January 19<sup>th</sup>

### CLASS OUTLINE

1. Elasticity
2. Elasticities and Government Intervention

## 1 Elasticity

**Elasticity:** Percentage change in one variable resulting from a 1-percent increase in another.

We usually see this in terms of percent change in quantity resulting from a change in another explanatory variable.

$$\text{Price Elasticity : } E_P = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\% \Delta Q}{\% \Delta P} = \frac{dQ}{dP} \frac{P}{Q}$$

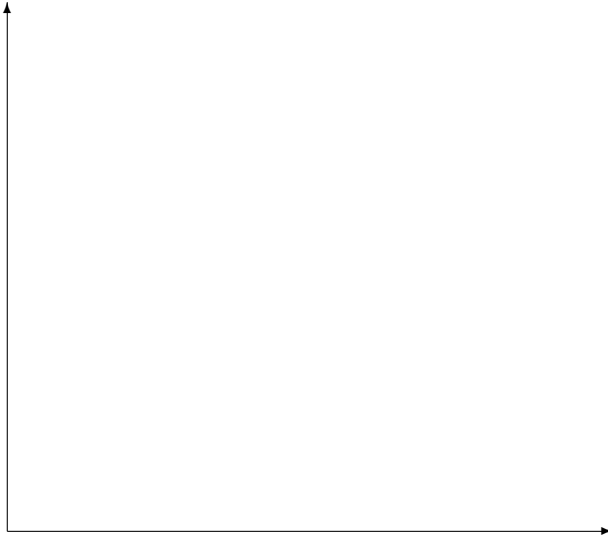
$$\text{Income Elasticity : } E_I = \frac{\Delta Q/Q}{\Delta I/I} = \frac{\% \Delta Q}{\% \Delta I} = \frac{dQ}{dI} \frac{I}{Q}$$

$$\text{Cross Price Elasticity : } E_{Q_m, P_s} = \frac{\Delta Q_m/Q_m}{\Delta P_s/P_s} = \frac{\% \Delta Q_m}{\% \Delta P_s} = \frac{dQ_m}{dP_s} \frac{P_s}{Q_m}$$

**Problem:** Assume  $Q_x = 300 - 3P_x + 2P_y + I$  is the demand for good  $x$  where good  $y$  is a substitute good and  $I$  is income. Find equations for the following elasticities. Further, if at initial equilibrium  $P_x = 50$ ,  $P_y = 100$  and  $I = 100$  calculate the value of the elasticity.

1. Find  $E_{P_x}$ .
2. Find  $E_I$ .
3. Find  $E_{Q_x, P_y}$

**Problem:** Find  $E_p$  of  $P = 300 - 2Q$ . Graph the demand curve and find the point where the elasticity is equal to  $-1$ . Indicate on the graph where the elasticity is greater than and less than  $-1$ .



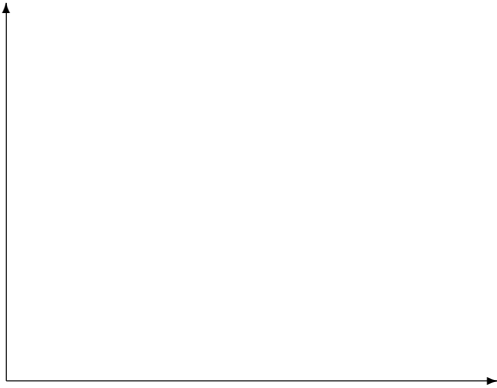
**Problem:** (P&R, Ch.2, Exercise 7)

In 1998, Americans smoked 470 billion cigarettes, or 23.5 billion packs of cigarettes. The average retail price was \$2 per pack. Statistical studies have shown that the price elasticity of demand is  $-0.4$ , and the price elasticity of supply is  $0.5$ . Using this information, derive linear demand and supply curves for the cigarette market.

## 2 Effect of Government Intervention

The effect of a government intervention depends on supply and demand elasticities of the good. For example, a specific tax is a fixed amount added to the cost of a good by the government. This creates a wedge between the price seen by producers and consumers so that  $P_P + t = P_C$ . The elasticity then tells us who takes on the bigger “burden” of the tax.

Inelastic Supply



Inelastic Demand

