PROBLEM SET #5: DESCRIBING DEMAND

Demand Elasticities

1.   Suppose demand for a good is given by $Q = 100 - P/2$.

   (a)   Draw the demand curve.
   (b)   Calculate ε_d when $p = 0$, $p = 100$, and $p = 200$ (using the formula for elasticity of demand at a given point on the curve).
   (c)   What price maximizes the revenue received by the seller? (Quick way – use calculus. Slow way – find the price by trial and error)
   (d)   What is ε_d at this revenue maximizing price? Is this just a coincidence?
   (e)   Draw a demand curve that has a constant elasticity of demand of -1.

Income Elasticities

2. The table below shows family income in $ versus average food consumption (in $), housing consumption per person (in ft^2), automobile consumption (in $), and public transportation consumption (in $).

Income ($)	Food consumption ($)	Housing (ft^2)	Autos ($)	Public Transport ($)
10,000	5,000	300	100	500
10,100	5,020	303	104	498
30,000	9,000	900	1,400	340
30,100	9,010	903	1,412	339

   (a)   Calculate the income elasticity of demand (ε_y) for each of the goods as income goes from $10,000 to 10,100 and as income goes from $30,000 to $30,100.

(b)   Which of the goods are **normal** and which **inferior**?

(c)   Which of the goods are **luxuries** and which **necessities**?

(d)   What is the connection between the income elasticities and what happens to the share of income spent on each good as incomes rise?

(e)   Can you think of a reason why the income elasticity of demand for automobiles would be so different for that of public transport?

(f)   What does the income elasticity of demand for housing imply about the size of future American cities if incomes per capita double in the next 30 years?