Ch. 3. Demand Theory

1. The Market Demand Curve
   a. Market demand schedule: (def’n)

b. Table

<table>
<thead>
<tr>
<th>Price per laptop</th>
<th>Quantity demanded per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3,000</td>
<td></td>
</tr>
<tr>
<td>$2,750</td>
<td></td>
</tr>
<tr>
<td>$2,500</td>
<td></td>
</tr>
<tr>
<td>$2,250</td>
<td></td>
</tr>
<tr>
<td>$2,000</td>
<td></td>
</tr>
</tbody>
</table>

c. Graph
Why is Quantity graphed on horizontal axis? Isn’t it the dependent variable? What did Alfred Marshall think?

2. Industry and Firm Demand Functions
   
   a. Factors in a demand function for good X: Mathematical expression
   Qd = f( )

   e.g., a linear expression might be:
   Qd =

   What are the theoretically expected signs of the coefficients? Let’s see.
   
   i. Price of good X: law of demand
ii. Income: two categories
   1. Normal goods
      a. Def’n
      b. Graph

2. Inferior goods
   a. Def’n
   b. Graph
iii. Tastes (preferences)

iv. Prices of other goods: Two categories
   1. Substitutes
      a. Def’n
      b. Graph
   2. Complements
      a. Def’n
      b. Graph
v. Advertising expenditures

vi. Expectations

b. Numerical example

i. \( Q_d = \)

ii. Interpret the meaning of each coefficient
iii. Suppose: I = $13,000, S = $400, A = $50,000,000

Then, Qd =

iv. Let S fall from $400 to $200,

Qd =
Notice that this is a function only of $P$. All of the other factors have been combined into the intercept term. Thus the demand curve will “shift” when one of the other factors changes. But the demand function is the same. We are only on a different part of the demand plane when the demand curve has “shifted”. Recall the distinction between “quantity demanded” and demand. This was only an aid for principles students. Let’s see how to draw a 3-dimensional demand curve.

\[
\text{Demand} = 100 - 2Px + 10I
\]

<table>
<thead>
<tr>
<th>Income</th>
<th>0</th>
<th>$10</th>
<th>$20</th>
<th>$30</th>
<th>$40</th>
<th>$50</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>$10</td>
<td>80</td>
<td>180</td>
<td>280</td>
<td>380</td>
<td>480</td>
<td>580</td>
</tr>
<tr>
<td>$20</td>
<td>60</td>
<td>160</td>
<td>260</td>
<td>360</td>
<td>460</td>
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<td>$30</td>
<td>40</td>
<td>140</td>
<td>240</td>
<td>340</td>
<td>440</td>
<td>540</td>
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<tr>
<td>$40</td>
<td>20</td>
<td>120</td>
<td>220</td>
<td>320</td>
<td>420</td>
<td>520</td>
</tr>
<tr>
<td>$50</td>
<td>0</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>500</td>
</tr>
</tbody>
</table>

Demand Plane for Normal Good

Managerial Economics Econ 4140/5140  Ch. 3 Demand Theory  Dr. Nieswiadomy
3. Price Elasticity of Demand
   a. Def'n
      i. Words
      ii. Mathematically
      iii. Absolute value
      iv. Graphical examples
b. Point and Arc Elasticity
   i. Problems with using point elasticity over wide ranges

   \[
   \begin{array}{cc}
   P & Q \\
   3 & 50 \\
   4 & 40 \\
   5 & 3 \\
   \end{array}
   \]

   ii. Solution: use arc elasticity
c. Using Demand Function to Calculate the Price Elasticity of Demand

d. How elasticity varies along linear demand curve
e. Price Elasticity and Total Money Expenditure
f. Total Revenue, Marginal Revenue, and Price Elasticity

g. Uses of Price Elasticity of Demand
   i. Never produce where demand is inelastic. Why?
h. Determinants of Price Elasticity of Demand
   i. Substitutes

   ii. % of budget

   iii. Time period

i. Price Elasticity and Pricing Policy

4. Income Elasticity of Demand
   a. Def'n

   b. Calculation
5. Cross Elasticity of Demand
   a. Def'n
   b. Calculation

6. Advertising Elasticity of Demand
   a. Def'n
   b. Calculation

7. Constant Elasticity Demand Function
   a. Form
b. Primer on logarithms