ECON 111: Fall 2021
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Problem Set 2

Please complete these problems to the best of your ability and submit your solutions on Gradescope by 11:59pm on Friday, September 17. When drawing any graphs, please use the appropriate labels on axes and specialization points.

1. Consider the following supply and demand curves in the market for wristwatches. Prices are expressed in U.S. dollars, and quantities are in thousands of wristwatches.

   - Demand: $Q_d = 40 - \frac{4P}{5}$
   - Supply: $Q_s = 2P - 20$

   (a) Sketch the supply and demand curves, and label the market equilibrium.

   (b) Compute the price elasticity of demand and price elasticity of supply at the equilibrium point.

   (c) Consider a case in which existing firms in the market collude and set a price of 30. What would the result of this (non-equilibrium) price be? Would the outcome be Pareto efficient? Why or why not?

   (d) Suppose that, due to a reduction in the price of mobile devices, the demand for wristwatches shifts to: $Q_d = 24 - \frac{4P}{5}$. What can you conclude about the relationship between wristwatches and mobile devices? How does this shift affect the price and quantity demanded at the new equilibrium?

   (e) Suppose that, due to the widespread distribution of mobile devices, many wristwatch producers leave the market, resulting in an inward shift of the supply curve (so that at every price, the quantity supplied is lower). You're not able to estimate the exact shift in the supply curve. What can you say about how this change, alongside the change in prices of mobile devices from part (d), would affect the equilibrium price and quantity demanded as compared to the original equilibrium from part (a)?

2. You observe the consumption patterns of a single individual over the course of a year in order to study how they respond to changes in economic conditions.[1] Over the course of your year of observation, several changes occur.

   (a) First, you find that after this person is promoted at their job and receives a raise from \$60,000 to \$63,000, their consumption of bottled water rises from 72 bottles per month to 90 bottles per month. Over this period, you observe no change in the price of bottled water or products you believe to be related to it. Compute the income elasticity of demand for bottled water for this person. Do they consider bottled water a normal or an inferior good?

   (b) Much later in the year, you find out that this person regularly takes anxiety medication to better their mental health. In response to an increase in the price of the medication that this person takes from \$200 per bottle to \$280 per bottle, their quantity demanded changes, according to your calculations, from 13 bottles per year to 11 bottles per year. What is their price elasticity of demand for this medication? Is it elastic, or inelastic?

   (c) Finally, toward the end of your study you notice that in response to a decrease in the price of winter jackets from \$120 to \$90 this person increases their demand for ski trips from 4 to 5 times per year. Compute their cross-price elasticity of demand for ski trips with regard to the price of winter jackets. What do you conclude about the relationshp between these goods for this person?

[1] You have informed them of your intention to research their behavior, and they have agreed to take part.