Elements of Microeconomics: TA Session

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September 20, 2024

Assignment 1

Solutions to Assignment 1 is posted on Canvas – Modules – Assignment Answer Keys

My office hours: Wednesdays, 14:30-15:30, Wyman Park W601A

Assignment 1, Question 1,A),i.

Explain whether you think the situation is efficient or not. If it is not efficient, why not? What actions would make it efficient?

- Electricity is included in the rent at your dorm. Some residents in your dorm leave lights, computers, and appliances on when they are not in their rooms

Answer: The use of resources is inefficient, the electricity at that time could be used in other activities that generate more value elsewhere. In addition, there is a cost of generating electricity such as burning fuels, hydroelectric power, which is not compensated for being used for anything. **Do not confuse efficiency with rationality**, even though the individual cost does not increase, the use of resources is inefficient.

Assignment 1, Question 1,B),ii.

Use the concept of opportunity cost to explain the Following: More people choose to do their own home repairs when the economy is slow and hourly wages are down

Answer: The **opportunity cost** of doing your own home repairs is the income you could have earned if you spent your repair time working instead. If hourly wages are down, **the opportunity cost of completing your own home repairs has decreased**. People will choose to do their own home repairs when the opportunity cost drops below the cost of hiring someone to do the repairs for you.

Assignment 1, Question 1,C),i.

For the following examples, state how you would use the principle of marginal analysis to make a decision:

- Deciding how many days to wait before doing your laundry

Answer: We must consider the marginal benefit and marginal cost of waiting one more day to do laundry. The **marginal benefit** may be time saved doing laundry. The **marginal cost** may be a decrease in choice of what to wear or a smellier laundry basket. We will **wait to do laundry for another day if the marginal benefit exceeds the marginal cost**. (Other reasonable MB and MC examples accepted)

Assignment 1, Q4

The supply and demand for solar panels are given by $Q_s = 250P - 100$ and $Q_D = 400 - 250P$, where P is the price per solar panel and Q measures the quantity of solar panels. Calculate the equilibrium price and quantity of Solar panels. **At what price will there be 10 units of surplus?** Show your work.

10 units of surplus means that quantity supplied exceeds quantity demanded by 10:

$$\begin{aligned} Q_s - Q_d &= (250P - 100) - (400 - 250P) = 10 \\ 500P &= 510 \\ P &= 1.02 \end{aligned}$$

Elasticity

Price elasticity of demand: a measure of how much the quantity demanded of a good responds to a change in its price

$$E_D = |\frac{\Delta Q/Q}{\Delta P/P}|$$

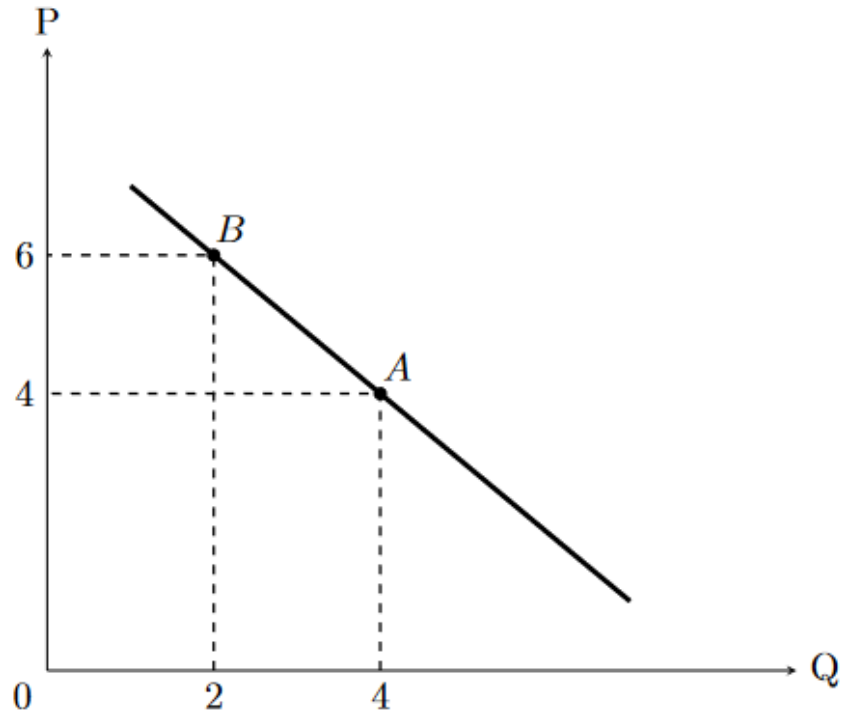
The demand of a good is:

- **elastic**, if price elasticity of demand > 1;
- **inelastic**, if the elasticity < 1;
- has **unit elasticity**, if the elasticity $= 1$.

Total revenue and demand elasticity: If demand is inelastic, seller's total revenue rises when price rises, and vice versa

Calculation of elasticity

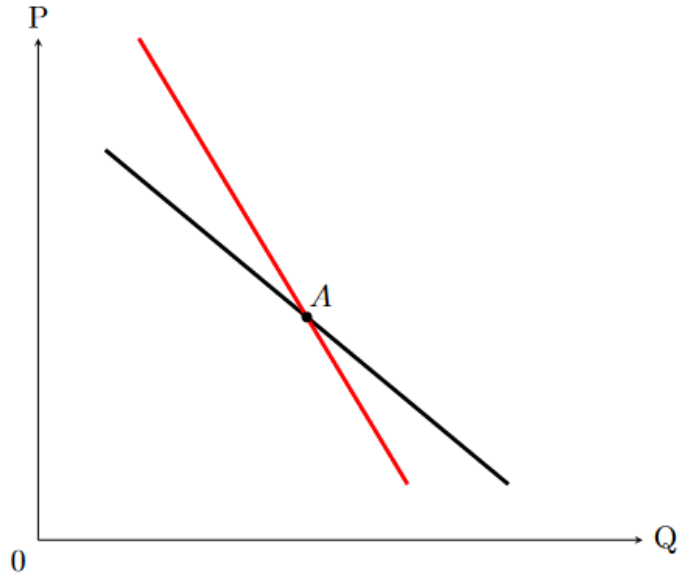
Using the mid-point method, calculate the price elasticity of demand between points A and B.



Answer: $E = \frac{(4-2)/3}{6-4/5} = \frac{5}{3}$

Slope and elasticity

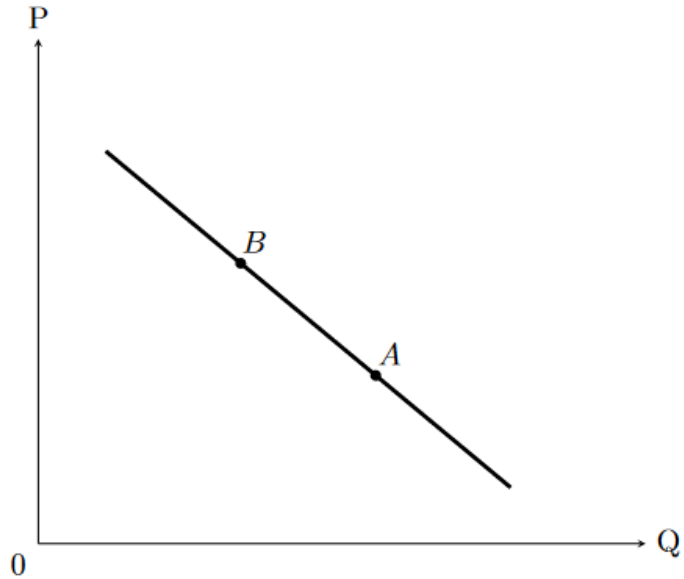
Without further information, can you tell which of the two demand curves has a higher demand elasticity at point A?



Answer: The black curve. Recall that $E_D = |\frac{\Delta Q/Q}{\Delta P/P}| = |\frac{\Delta Q}{\Delta P}| \cdot \frac{P}{Q}$. The slope of demand curve is the inverse of $\frac{\Delta Q}{\Delta P}$, whereas $\frac{P}{Q}$ is the same for two curves at point A. The black demand curve is less steep, having a higher $|\frac{\Delta Q}{\Delta P}|$, so the black demand curve has a higher demand elasticity at point A.

Slope and elasticity

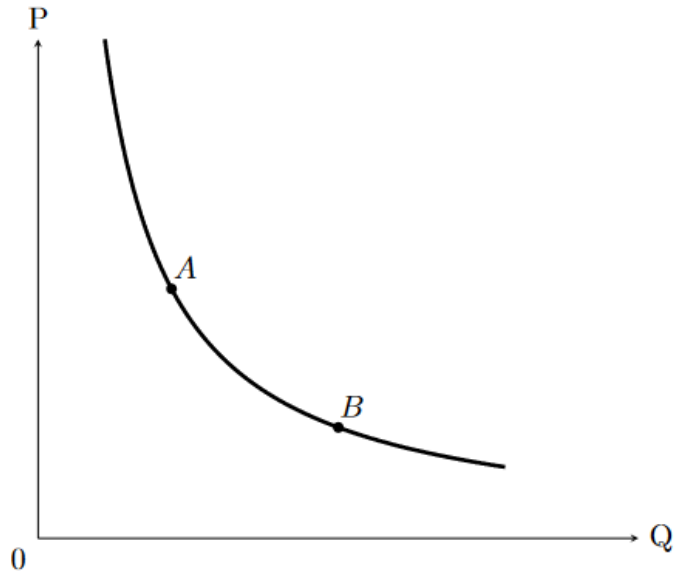
Without further information, can you tell which point has a higher demand elasticity, A or B?



Answer: Point B. Again, recall that $E_D = |\frac{\Delta Q/Q}{\Delta P/P}| = |\frac{\Delta Q}{\Delta P}| \cdot \frac{P}{Q}$. This time, points A and B has the same slope, and hence the same $|\frac{\Delta Q}{\Delta P}|$. But point B has a higher $\frac{P}{Q}$, and therefore has a higher demand elasticity.

Slope and elasticity

Without further information, can you tell which point has a higher demand elasticity, A or B?



Answer: We cannot tell. Recall that $E_D = |\frac{\Delta Q/Q}{\Delta P/P}| = |\frac{\Delta Q}{\Delta P}| \cdot \frac{P}{Q}$. Here, point B has a smaller slope and hence a higher $|\frac{\Delta Q}{\Delta P}|$, but point A has a higher $\frac{P}{Q}$. Their elasticity is incomparable without further information

Slope and elasticity

What is the relationship between the slope of the demand curve and the price elasticity of demand? Does the slope perfectly predict elasticity?

Answer: The slope has some relationship with elasticity, but does not perfectly predict it. With $E_D = |\frac{\Delta Q/Q}{\Delta P/P}| = |\frac{\Delta Q}{\Delta P}| \cdot \frac{P}{Q}$, the position of the points of concern, as well as the slope there, determines elasticity.