ANSWER ON QUESTION #74466, ECONOMICS / MICROECONOMICS

Q. Suppose demand for good A is given by $D_A = 500 - 10\, P_a + 2\, P_b + 0.70I$ where P_a is the price

of good A, P_b is the price of some other good B, and I is income. Assume that P_a is currently $10,

P_b is currently $5, and I is currently $100.

a. What is the elasticity of demand for good A with respect to the price of good A at the current

situation? Interpret the nature of elasticity of demand.

Answer:

$D_A = 500 - 10\, P_a + 2\, P_b + 0.70I$

$P_a = \$10$

$P_b = \$5$

$I = \$100$

Put these values in above demand function:

$D_A = 500 - (10*10) + (2*5) + (0.70*100)$

$D_A = 480 \Rightarrow Q_0$

If the price of good A is increased to $15 then its quantity demanded will be:

$D_{A1} = 500 - (10*15) + (2*5) + (0.70*100)$

$D_{A1} = 430 \Rightarrow Q_1$

Then, the elasticity of demand for good A with respect to the price of good A is:

$$E_d = \frac{\left[\dfrac{Q_1 - Q_0}{\left(\dfrac{Q_1 + Q_0}{2}\right)}\right]}{\left[\dfrac{P_1 - P_0}{\left(\dfrac{P_1 + P_0}{2}\right)}\right]}$$

$$E_d = \frac{\left[\dfrac{430 - 480}{\left(\dfrac{430 + 480}{2}\right)}\right]}{\left[\dfrac{15 - 10}{\left(\dfrac{15 + 10}{2}\right)}\right]}$$

$$E_d = -0.27$$

The price elasticity of demand is negative. It means the elasticity of demand for good A with respect its price is inelastic.

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