

Answer on Question #67149 – Economics - Microeconomics

Question

A firm's demand function for good x is estimated as follows:-

$$Q_x = 1800 - 1/4P_x + 1/8P_y - 1/3P_z + 1/5Y$$

Where Q_x represents quantity demanded of good x, P_x is price of good x, P_y is price of good y, P_z is price of good z and Y is income.

Explain whether the law of demand is valid here

Answer

Let's analyze elasticities:

- demand elasticity:

$$E_x = -1/4$$

$$E_x = \Delta Q_x / \Delta P_x$$

$E_x < 0$, - so, when the price goes up, the quantity demanded goes down and the law of demand is valid;

- cross elasticity:

$$E_{xy} = 1/8$$

$$E_{xy} = \Delta Q_x / \Delta P_y$$

$E_{xy} > 0$ – so, when the price of good y goes up, the quantity demanded of good x goes up; the law of demand is valid if x and y are substitutes;

$$E_{xz} = -1/4$$

$$E_{xz} = \Delta Q_x / \Delta P_z$$

$E_{xz} < 0$ - so, when the price of good y goes up, the quantity demanded of good x goes down; the law of demand is valid if x and z are complements;

- income elasticity of demand:

$$E_y = 1/5$$

$$E_y = \Delta Q_x / \Delta Y$$

$E_y > 0$ - so, when income goes up, the quantity demanded of good x goes up; the law of demand is valid if x is normal good;