Answer on Question #39978 – Economics – Microeconomics

Assignment

The demand for good X is given by this equation:
QX =1.0–2.0PX +0.8I+1.5PY –3PZ+1.0A
Where PX, PY, and PZ represent the prices of goods X, Y, and Z;
I measures income per capita; and A is advertising. Currently:
PX =2.00,PY =2.50,PZ =1.00,I=4,andA=3.05.

Is good X a necessity or a luxury good? How do you know?

Calculate the cross elasticity of demand for X with respect to the price of good Z. Are goods X and Z substitutes or complements?

Solution

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where PX, PY, and PZ represent the prices of goods X, Y, and Z; I measures income per capita; and A is advertising.
PX =2.00,PY =2.50,PZ =1.00,I=4,and A=3.05.

A. Is good X a necessity or a luxury good? How do you know?
Qx = 1 - 2*2 + 0.8*4 + 1.5*2.5 - 3*1 + 1*3.05 = 4 units
It is a luxury good, as its quantity is only 4 units.

B. Calculate the cross elasticity of demand for X with respect to the price of good Z. Are goods X and Z substitutes or complements?

$$E_{A,B} = \frac{P_{B,1} + P_{B,2}}{Q_{A,1} + Q_{A,2}} \times \frac{\Delta Q_A}{\Delta P_B} = \frac{\partial Q_A}{\partial P_B} \frac{P_B}{Q_A}$$

So, Ex,z = k*Pz/Qx = -2*1/4 = -0.5, where k is coefficient before Px as the derivative of ΔQ/ΔP.
Two goods that complement each other show a negative cross elasticity of demand: as the price of good Y rises, the demand for good X falls. So, x and z are complements.