Answer on Question #39434 – Economics – Microeconomics

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.
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.

C. Calculate the advertising elasticity of demand for X. Interpret your answer.

$$E_d = \frac{P}{Q_d} \times \frac{dQ_d}{dP}$$

So, Ed = k*A/Qx = -2*3.05/4 = -1.525, where k is coefficient before Px as the derivative of ΔQ/ΔP, so the advertising is elastic as Ed < -1.

D. What kind of change in the price of X would you recommend if the firm is interested in maximizing revenue?

As the advertising is elastic, the decrease in price will increase the revenue, as the change in quantity demanded will be higher than the change in price.