

Problem Definition

Problem 37. **Revenue:** The demand for a car wash is

$$x = 600 - 50p$$

where the current price is \$5.00. Can revenue be increased by lowering the price and thus attracting more customers? Use price elasticity of demand to determine your answer.

Solution Step 1:

The first step is to compute the derivative of the of the price with respect to demand. Using implicit differentiation we can write

$$1 = -50 \frac{dp}{dx}$$

or

$$\frac{dp}{dx} = -0.02$$

Solution Step 2:

For the price $p=5.00$,

$$x = 600 - 50(5) = 600 - 250 = 350$$

The value of price elasticity is given by

$$\eta = \frac{p/x}{dp/dx} = \frac{5/350}{-0.02} = -\frac{250}{350} = -\frac{5}{7}$$

Since the absolute value of η is less than one the price is not elastic meaning it is unlikely the car wash will see increased revenue from lowering the price.