

Problem 9

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At the current price of \$8, you sell 24 units. Cost is \$4/unit. Based on publicly available estimates, you think the elasticity of demand is approximately -3. Estimate the profit maximizing price and the quantity sold and profit at that price.

$$\text{Current } \pi = 24 \cdot 4 = 96$$

$$MC = 4 \quad \epsilon^d = -3$$

$$P = MC \left(\frac{\epsilon^d}{1 + \epsilon^d} \right)$$

$$P = 4 \left(\frac{-3}{1 + -3} \right)$$

$$P = 4 \left(\frac{-3}{-2} \right)$$

$$P = 4 \cdot 1.5$$

$$P = 6$$

$$-3 = \frac{\Delta q}{q} \cdot \frac{P}{q} = \frac{\Delta q}{-2} \cdot \frac{8}{24} \Rightarrow \Delta q = 18$$

$$q = 24 + 18 = 42$$

$$\pi = (6 - 4)(42) = 2 \cdot 42 = 84$$