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.

Current $\pi = 24 \cdot 4 = 96$

$MC = 4 \qquad 3^d = -3$

$P = MC\left(\frac{3^d}{1+3^d}\right)$

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

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

$P = 4(1.5)$

$P = 6$

$-3 = \frac{\Delta q}{\Delta p} \cdot \frac{p}{q} = \frac{\Delta q}{-2} \cdot \frac{8}{24} \rightarrow \Delta q = 18$

$q = 24 + 18 = 42$

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