HW 6 Elasticity Given

Sunday, September 27, 2020 6:47 PM

Worked w/ Austin

Initially, a profit maximizing local monopolist charges $15 and sells 500 units per week. Elasticity of demand is -3. The monopolist's cost function is C(Q)=F+cQ where F is a fixed cost and c is the constant per unit variable cost.

a) What is the per unit cost of the product?

b) What are the demand and inverse demand functions?

Now assume the local government begins to provide 100 units per week at the market price.

c) What is the residual demand left for the monopolist?

d) Find the new price and the monopolist's quantity and the total market quantity.

e) Assume the METB is 0.25. Find the changes in CS, PS, GS, and SS.

f) Depict all of this in a diagram. You probably want to sketch the diagram right at the start of the problem for reference as you work, and then to redraw a neat version to submit.

a) per unit = 15/500 = .03/unit

b) $\varepsilon = -\frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$

$-3 = (Q-500)/(P-15) \cdot 15/500$

$-100 = (Q-500)/(P-15)$

$-100P + 1500 = Q - 500$

$Q = 2000 - 100P$

$Q - 2000 = -100P$

$P = 20 - Q/100$

c) $res = Q - q'$

$res = (2000 - 100P) - 100$

$res = 1900 - 100P$

$P = 19 - .01Q$

d) $P = 19 - .01Q$

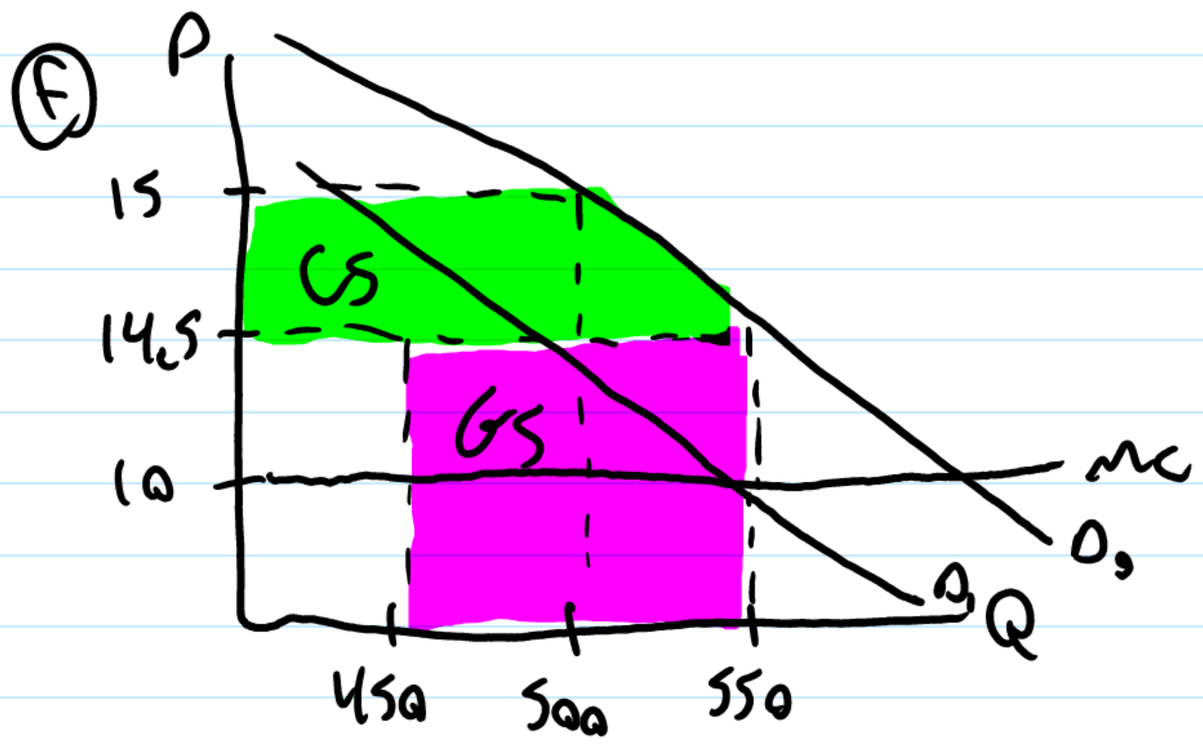
$P = 19 - (.01 \cdot 450)$

$P = 14.5$

$Q = 1900 - ((00 \cdot 14.5)$

$Q = 450$

f)



e) $\Delta CS = (.5 \cdot 500) + (\frac{1}{2} \cdot 50 \cdot .5)$

$\Delta CS = 262.5$

$\Delta PS = (-1 \cdot .5 \cdot 500) - (50 \cdot 4.5)$

$\Delta PS = -475$

$\Delta GS = (100 \cdot 14.5)$

$\Delta GS = 1450$

$\Delta SS = 262.5 - 475 + (1.25 \cdot 1450)$

$\Delta SS = 1600$