

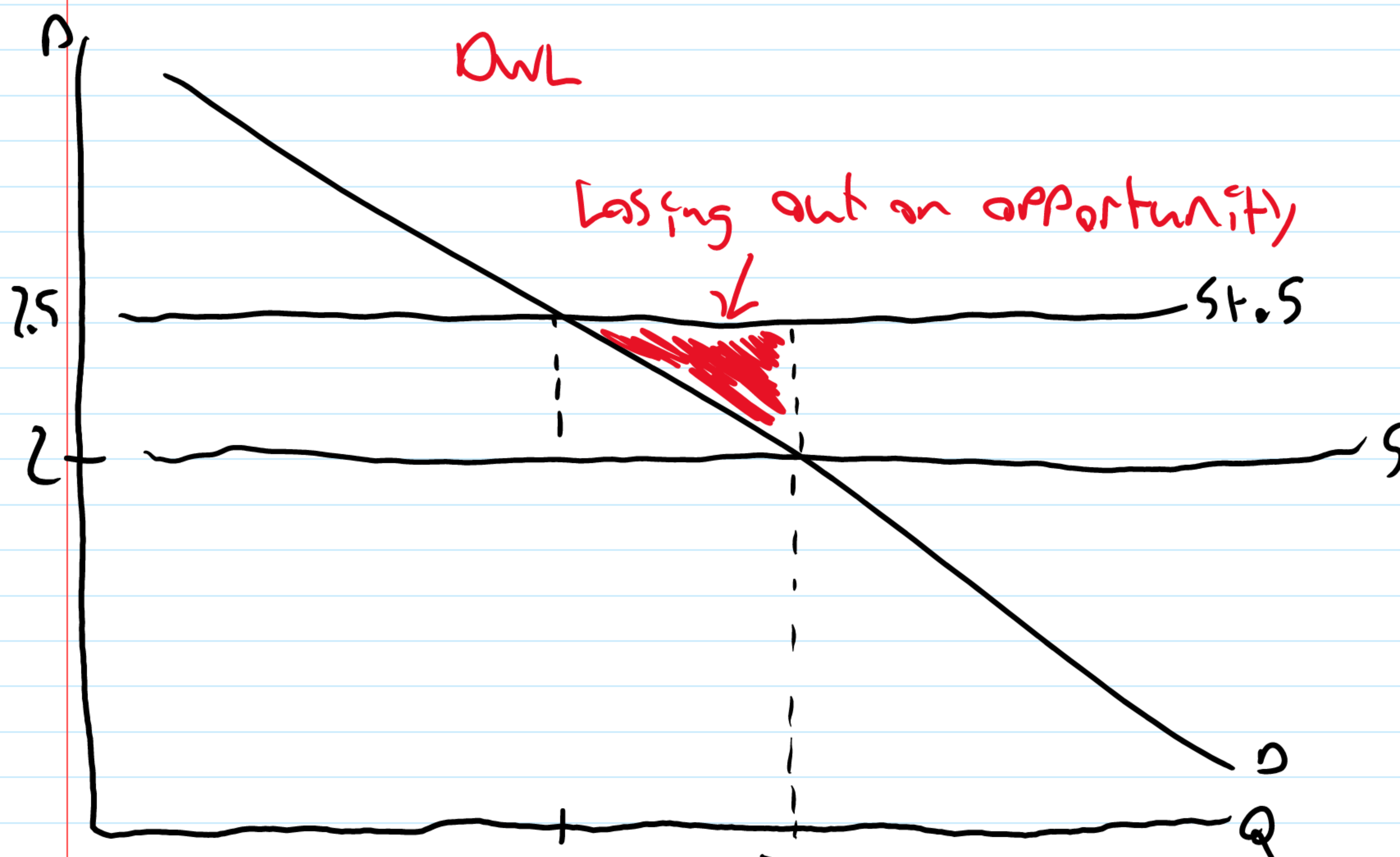
## 5 Extra Problems

Friday, September 11, 2020 2:02 PM

Suppose the current price of gasoline is \$2 per gallon, at which price 20 million gallons are consumed daily. The elasticity of demand is -0.8. Suppose that in addition to the private costs of production and sales born by sellers, each gallon of gasoline consumed releases carbon and pollutants into the air imposing a burden on the rest of society equivalent to \$0.50 per gallon. Assume this is a constant cost industry and that the METB is 0.2.

- 1) Over consumption of gasoline will lead to a DWL. How much overconsumption is there? Hint: You must first calculate the allocatively efficient quantity, which would balance the full costs against the benefits of consumption.
- 2) Illustrate.
- 3) How big is the DWL? Include it in the illustration.
- 4) How might the DWL be corrected?
- 5) All things considered, what would be the net benefit of that correction?

$$\left. \begin{matrix} \epsilon^d = -0.8 & Q = 20m & P = 2 & METB = 0.2 \end{matrix} \right\} =$$



$$-0.8 = \frac{\Delta Q}{\Delta P} \cdot \frac{2}{20m}$$

$$-0.8 = \frac{\Delta Q}{0.5} \cdot \frac{2}{20m} \Rightarrow -0.8 = \Delta Q = -4m$$

$$\frac{1}{2}(.5)(4) = -2 \cdot .5 = -1 = \text{DWL}$$

IF DWL is negative, flip triangle to above demand

NSB of 50¢ tax

1. Suppose a profit maximizing monopolist is charging a price of \$12, and the best available estimate of the elasticity of demand is -4. If the monopolist's marginal cost is constant, estimate its value.

$$\epsilon^d = -4$$



$$-4 = 12/Q \cdot$$

$$MR = MC$$

$$MR = \Delta R / \Delta Q$$

$$MR = P(1 + 1/\epsilon^d)$$