

Daily Exercise Solution

Initial data:

$$P_1^S = \$100$$

$$Q_1^S = 1000$$

$$\eta_s = +2$$

Policy goal:

$$Q_2^S = 1200$$

Using the elasticity to find the price:

Percent change in Q needed

$$\% \Delta Q^S = \frac{1200 - 1000}{1000} = 0.2 = +20\%$$

Definition of the elasticity

$$\eta_s = \frac{\% \Delta Q^S}{\% \Delta P^S}$$

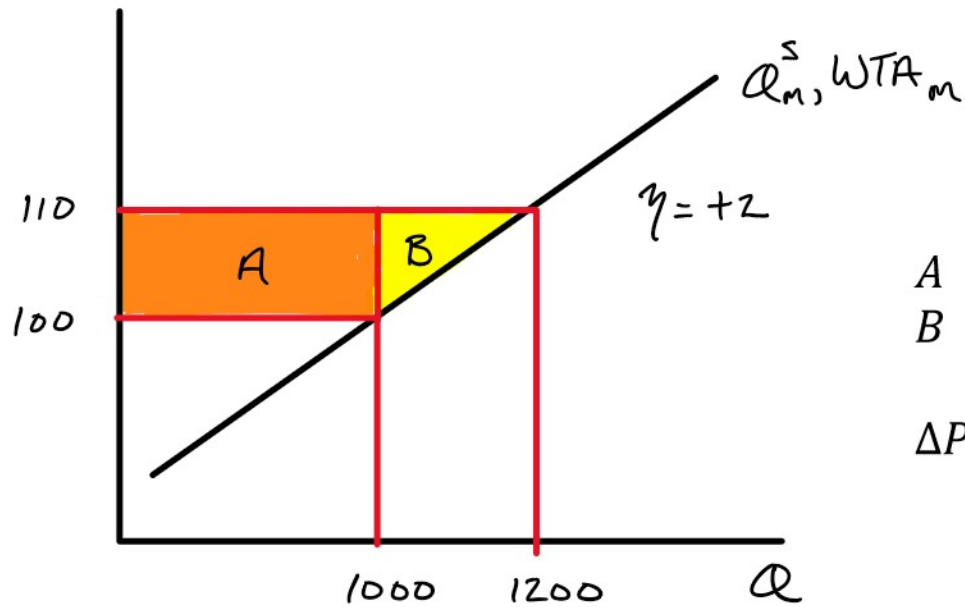
Solving for the new price:

$$+2 = \frac{20\%}{\% \Delta P^S}$$

$$\% \Delta P^S = \frac{20\%}{2} = 10\%$$

$$P_2^S = \$100 + 0.1 * \$100 = \$110$$

Calculating ΔPS :



$$A = 10 * 1,000 = 10,000$$

$$B = 0.5 * 10 * 200 = 1,000$$

$$\Delta PS = A + B = \$11,000$$

Extra credit piece on the demand side:

$$\% \Delta Q^D = +20\%$$

$$\eta = \frac{\% \Delta Q^D}{\% \Delta P^d}$$

$$\% \Delta P^d = \frac{\% \Delta Q^D}{\eta} = \frac{+20\%}{-1} = -20\%$$

$$P_2^d = \$100 - 0.2 * \$100 = \$80$$

Overall policy:

Supply: raise P^s by \$10

Demand: lower P^d by \$20

Actual policy would be a \$30 subsidy:

$$\$80 + \$30 = \$110$$

$$P^d + S = P^s$$