Solution to Sample Quiz

ENVIRON 805K

October 11, 2017

1.

See Figure 1. Subfigure (a) represents the individual demand. Subfigure (b) represents the aggregate demand for rival good. Subfigure (c) represents the aggregate demand for non-rival good

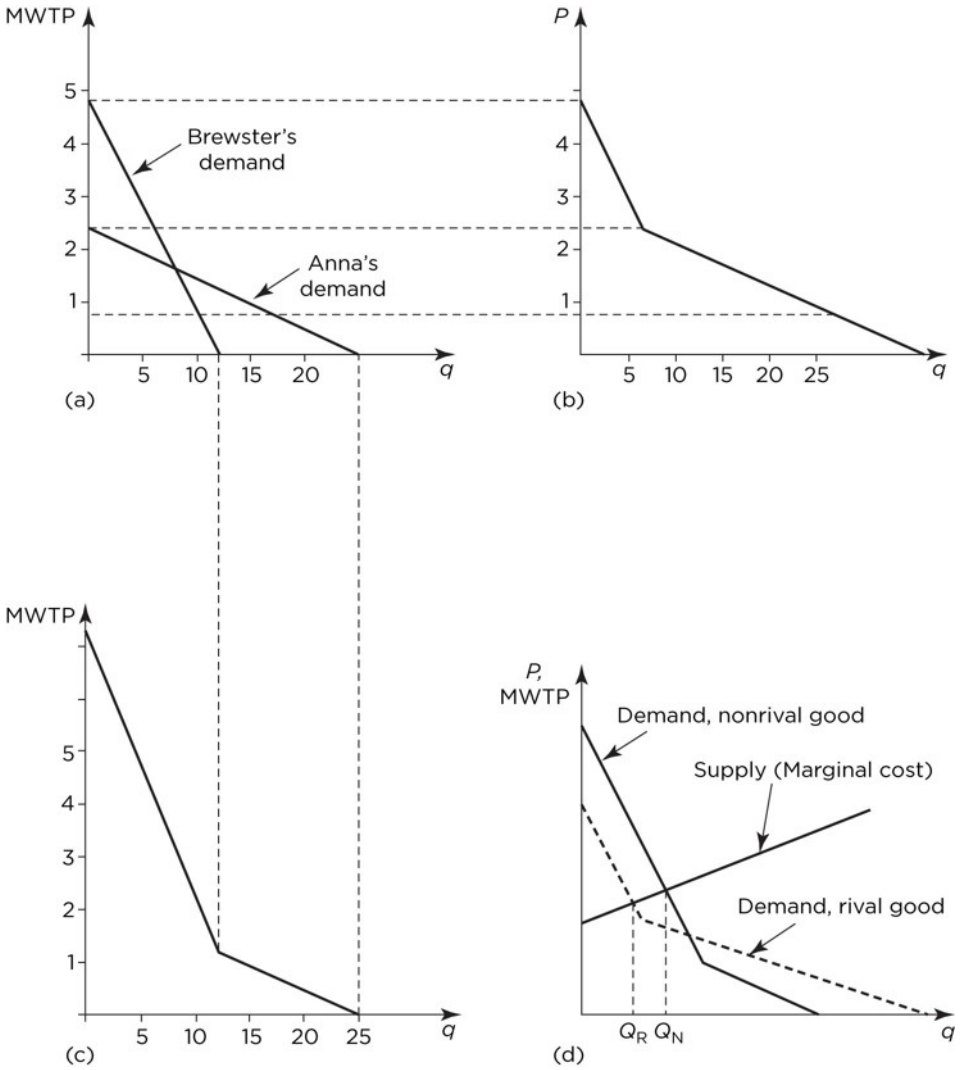

Figure 1: The Demand of Rival and Non-rival Good

2.

(a) At the competitive equilibrium, the demand for gasoline equals its supply. That is to say

$$\begin{aligned} Q^d &= Q^s \\ \Rightarrow 6 - 2P &= P \\ \Rightarrow P &= 2 \end{aligned}$$

Therefore, the equilibrium price is $P = 2$. The demand and supply for gasoline is 2.

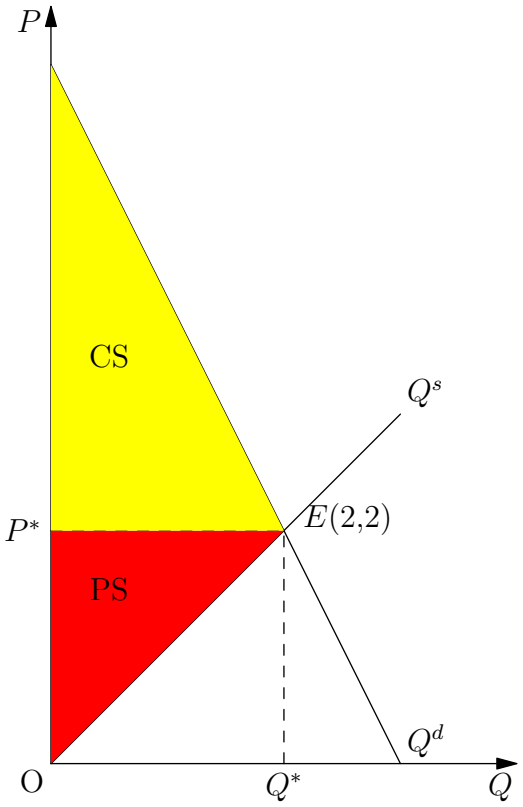

Figure 2: Market Equilibrium

(b) $CS = 6$

(c) $PS = 1$

3.

First Theorem of Welfare Economics: In a competitive economy, a market equilibrium is Pareto optimal.

4. The total damage cost is

$$\text{PV} = \sum_{t=0}^{t=10} \frac{D_t}{(1+r)^t}$$

where $D_t = 0.5$ for all t.