Lecture 2- In Class Problems

EVENING-

9/8/2020

1. Suppose that market for hamburgers was in equilibrium, with a supply curve of $Q^S = 2000P - 10000$ and a demand curve of $Q^D = 20000 - 1000P$. Responding to populist citizen pressure, the government puts a price ceiling of \$8 on hamburgers.

(a) In market equilibrium, before the ceiling, find

(a) equilibrium price

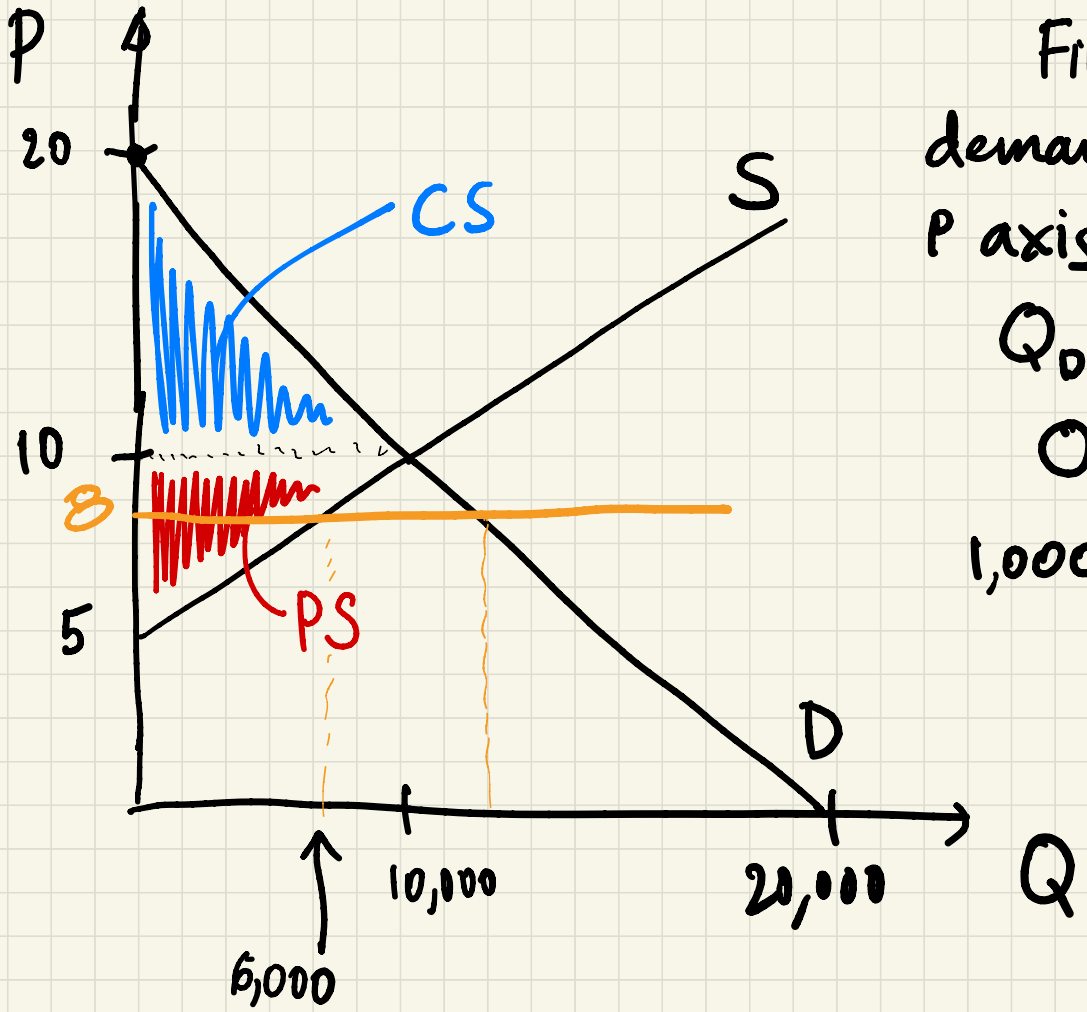
(b) producer surplus

(c) consumer surplus

$Q_S = Q_D$

$2000P - 10{,}000 = 20{,}000 - 100P$

$\Rightarrow$ $P = 10$



Find P where demand curve hits P axis

$Q_D = 20{,}000 - 1000P$

$0 = 20{,}000 - 1000P$

$1{,}000P = 20{,}000$

$P = 20$ when $Q_D = 0$

Find a second pt on the demand curve.

(a) Find Q when P = 0

(b) Find Q when P = 10

(a) $Q_D = 20,000 - 1000P$

$Q_D = 20,000 - 1000(0)$

$Q_D = 20,000$

Find eqbm qty

Plug in eqbm price into Q_D or Q_S

$Q_D = 20,000 - 1000(10)$

$= 20,000 - 10,000$

$= 10,000 = Q_D$

$$CS = \frac{1}{2}(b)(h)$$

$$= \frac{1}{2}(10{,}000)(20-10)$$

$$= \frac{1}{2}(10{,}000)(10)$$

$$= 50{,}000 = CS$$

PS - Find P where $Q_s = 0$

$$Q_s = 2000P - 10{,}000$$

$$0 = 2000P - 10{,}000$$

$$10{,}000 = 2000P$$

$$P = 5$$

$$PS = \frac{1}{2}bh$$

$$= \frac{1}{2}(10{,}000)(10-5)$$

$$= 5{,}000 \cdot 5$$

$$= 25{,}000 = PS$$

1. Suppose that market for hamburgers was in equilibrium, with a supply curve of $Q^S = 2000P - 10000$ and a demand curve of $Q^D = 20000 - 1000P$. Responding to populist citizen pressure, the government puts a price ceiling of \$8 on hamburgers.

(b) After the price ceiling, find

(a) new quantity

(b) producer surplus

(c) consumer surplus

Find new qty when P = 8

$Q_S = 2000P - 10{,}000$

$Q_S = 2000(8) - 10{,}000$

$Q_S = 16{,}000 - 10{,}000$

$Q_S = 6{,}000$

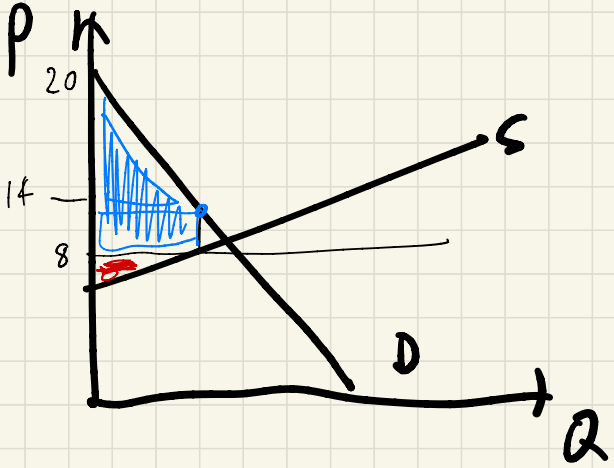
New PS

$PS = \frac{1}{2}bh$

$= \frac{1}{2}(6{,}000)(8-5)$

$= 3000 \times 3$

$PS = 9000$



New CS

First, find P such that $Q_D = 6000$

$Q_D = 20{,}000 - 1000P$

$6{,}000 = 20{,}000 - 1000P$

$1000P = 14{,}000$

$P = 14$

New CS = rectangle + triangle

$= 6{,}000(14-8) + \frac{1}{2}(6{,}000)(20-14)$

1. Suppose that market for hamburgers was in equilibrium, with a supply curve of $Q^S = 2000P - 10000$ and a demand curve of $Q^D = 20000 - 1000P$. Responding to populist citizen pressure, the government puts a price ceiling of \$8 on hamburgers.

(b) After the price ceiling, find

(d) transfer

(e) deadweight loss

(f) deadweight loss as a share of the transfer (from either producers to consumers or vice-versa)

Size of the transfer
= rectangle
= (6,000)(10 - 8)
= 12,000 $

(e) DWL = $\frac{1}{2}bh$
= $\frac{1}{2}(10{,}000 - 6{,}000)(14 - 8)$
= $\frac{1}{2}(4{,}000)(6)$
= 12,000 = DWL

(f) $\frac{\text{DWL}}{\text{transfer}}$
= $\frac{12{,}000}{12{,}000}$ = 1

(c) Up until now, we assumed that all hamburgers were created equal, and it is self-evident that they are not. If there is a variety of hamburger quality, which hamburger sellers will be the most harmed by this policy?

2. GLS Chapter 3, Question 3

The annual demand for full-spectrum LED light bulbs in Fairbanks, Alaska, is estimated to be $Q^D = 20,000 - 1000P$. The supply is estimated to be $Q^S = -12,000 + 3,000P$.

(a) Find the equilibrium price and quantity of LED light bulbs in Fairbanks, Alaska.

(b) Calculate consumer and producer surplus at the equilibrium price.

(c) What is the total surplus created in the market for LED light bulbs?

(d) (my addition) Would consumers get more surplus if the price were \$6 and the quantity were unchanged?