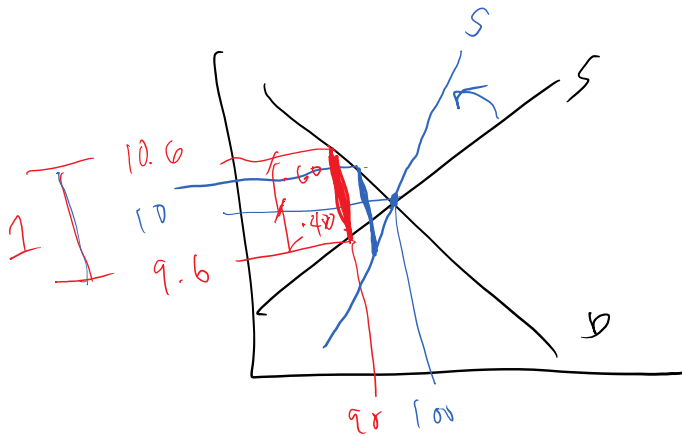
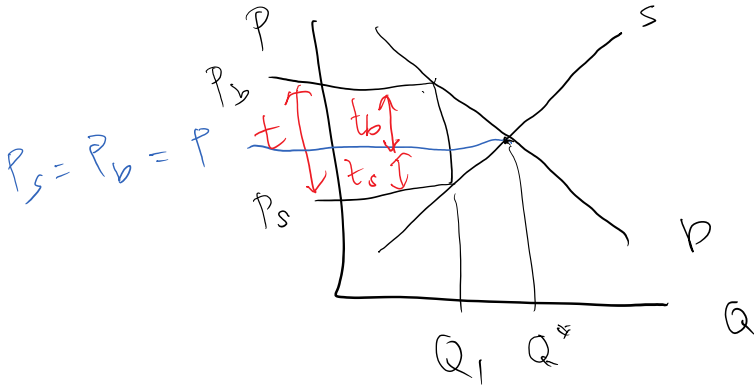


1. Assume that Congress passes a new per-unit tariff on imported sugar. Suppose that the price elasticity of the demand for sugar is .5, and the supply of sugar is perfectly elastic (i.e. the supply curve is horizontal). Holding all else constant, the majority of the tax burden is likely to be borne by:

- A. Producers
- B. Consumers
- C. The elasticity of demand has no effect on tax incidence
- D. None of the above

$$P_b = P_s + t$$

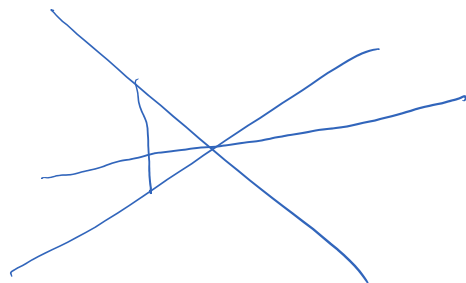
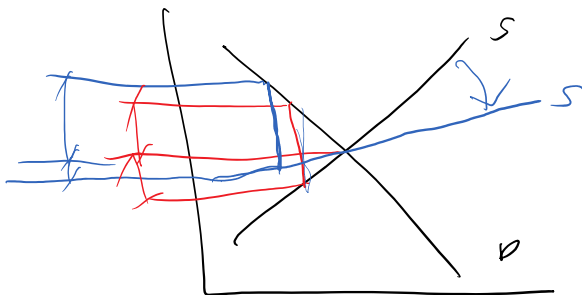
$$P_b \geq P_s$$

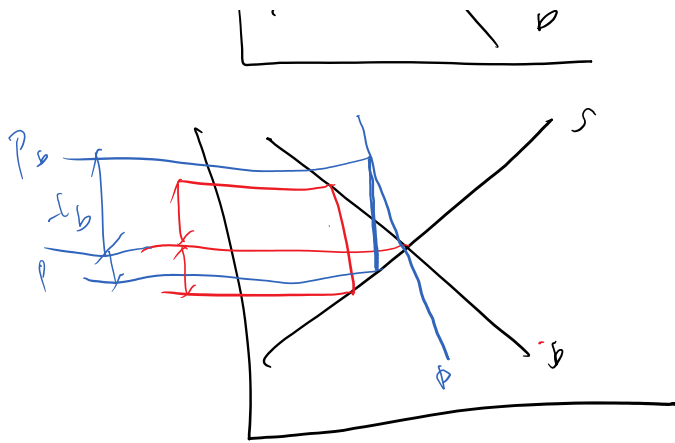


	no tax	tax
P_b	10	10.6
P_s	10	9.6
Q_D	100	90
Q_S	100	90
t_b	0	.60
t_s	0	.40

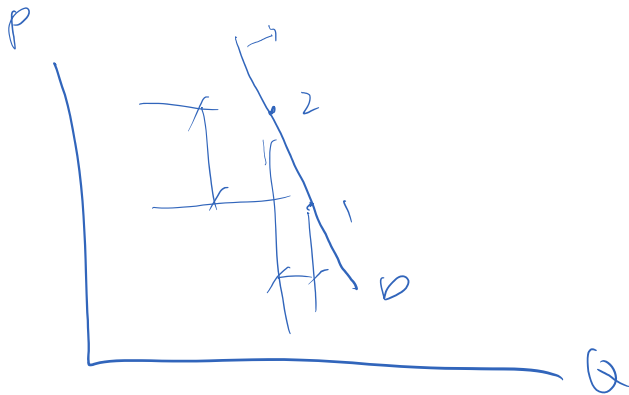
S more inelastic $\rightarrow t_b \downarrow, t_s \uparrow$

S more elastic $\rightarrow t_b \uparrow, t_s \downarrow$



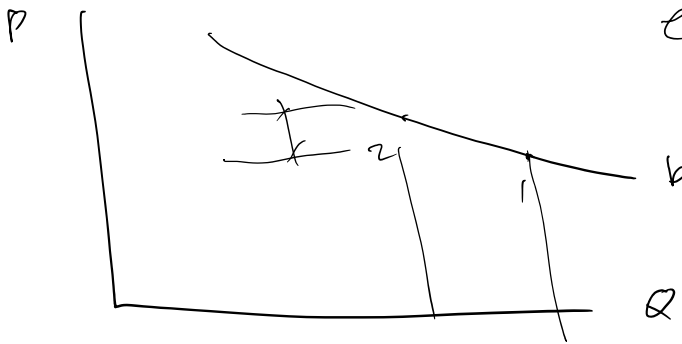


D more inelastic
 $\rightarrow t_b \uparrow, t_s \downarrow$



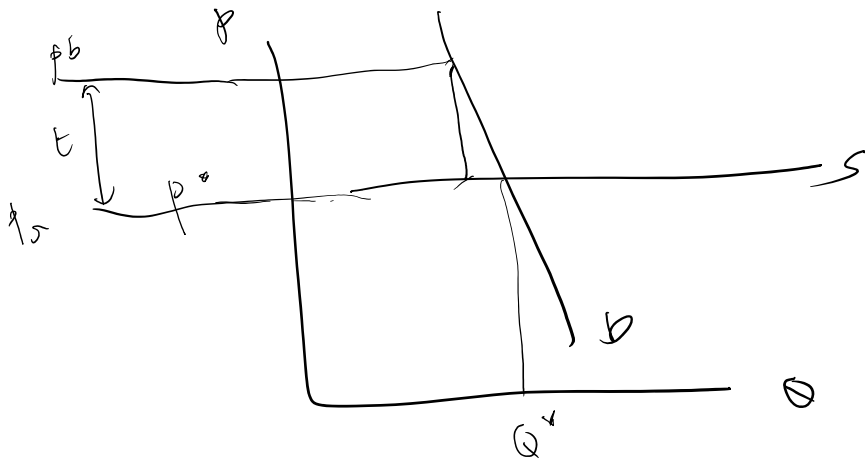
$$e = \frac{\% \Delta Q}{\% \Delta P} = \frac{\text{small} \downarrow}{\text{big} \downarrow}$$

$\% \text{ inelastic} \rightarrow e = 0$



$$e = \frac{\% \Delta Q}{\% \Delta P} = \frac{\text{big} \uparrow}{\text{small} \downarrow} \rightarrow \infty$$

$\% \text{ elastic} \rightarrow e = \infty$

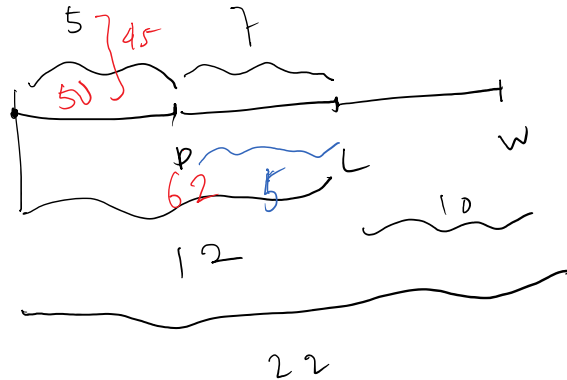


All tax is paid
 by buyer!!

2. You have been hired as a consultant to advise the Northern Virginia Regional Transportation Authority on the best course of action with regard to an extension of the Metro. The expected total cost of extending the Metro from West Falls Church to Dulles Airport is \$5 billion; the expected total cost of extending the Metro from West Falls Church past Dulles to Leesburg is \$12 billion; the expected total cost of extending the Metro from West Falls Church past Dulles, past Leesburg to Winchester in the Shenandoah Valley is \$22 billion. The expected total benefit of extending the Metro from West Falls Church to Dulles Airport is \$50 billion; the expected total benefit of extending the Metro from West Falls Church past Dulles to Leesburg is \$62 billion; the expected total benefit of extending the Metro from West Falls Church past Dulles, past Leesburg to Winchester in the Shenandoah Valley is \$65 billion. What is your advice regarding the proposed extension?

- A. Do not extend the Metro
- B. Extend the Metro to Dulles
- C. Extend the Metro to Leesburg
- D. Extend the Metro to Winchester

To	EC	EB	MC	MB	Net = MB-MC
Do nothing	0	0			
Dulles	5	50	5-0 = 5	50-0 = 50	50-5=45
Leesburg	12	62	12-5 = 7	62-50 = 12	12-7 = 5
Winchester	22	65	22-12 = 10	65-62 = 3	3-10 = -7



3. A gym conducts a survey of its customers, which shows that a 10% increase in its fees would lead to a 7% decrease in membership. If the gym wants to increase its total revenue, it should _____ fees because the demand for gym membership is _____.

- A. raise; elastic
- B. not raise; elastic
- C. raise; inelastic
- D. not raise; inelastic

$$e = \frac{\% \Delta Q}{\% \Delta P} = \frac{-7\%}{10\%} = -0.7 \quad (\text{inelastic})$$

$$R = P \times Q$$

$$\% \Delta R = \% \Delta P + \% \Delta Q$$

$$\% \Delta Q = -7\% \text{ } \% \Delta P$$

Say $\% \Delta P = +1\%$

$$\Rightarrow \% \Delta Q = -7(1\%) = -7\%$$

$$\% \Delta R = 1\% - 7\% = -6\%$$

Rule: $|e| < 1$

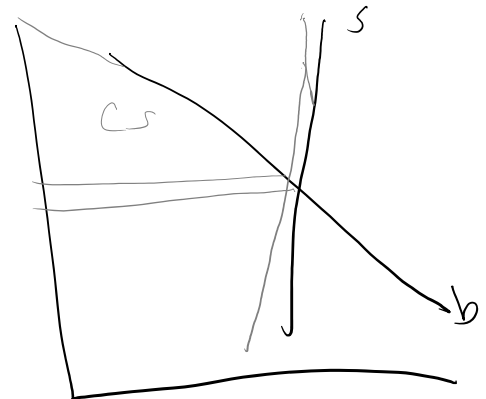
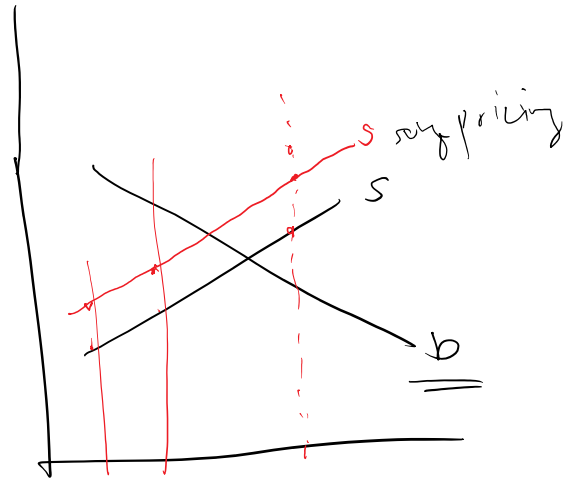
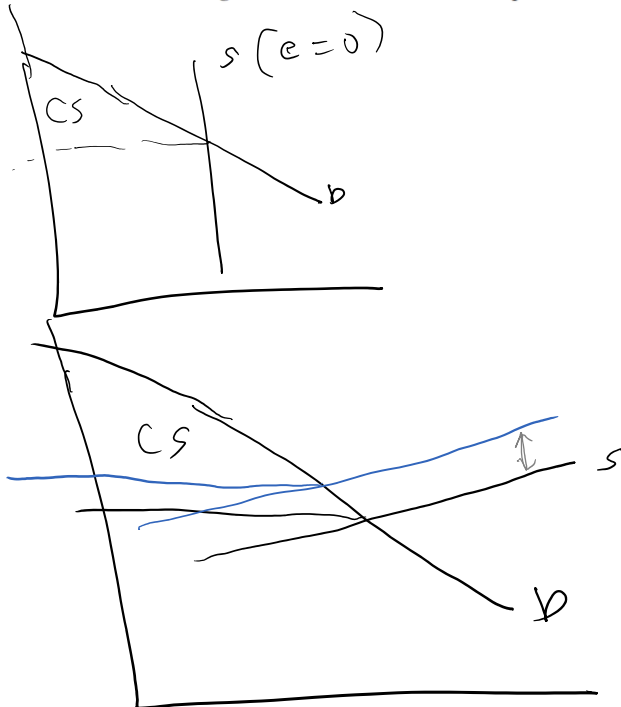
Rule:
 If D is inelastic ($|e| < 1$)
 $\Rightarrow \uparrow P$ to \uparrow Rev.

If D is elastic ($|e| > 1$)
 $\Rightarrow \downarrow P$ to \uparrow Rev.

$$\begin{aligned} \text{Exy } \% \Delta P &= -1\% \\ \Rightarrow \% \Delta Q &= -0.7 (-1\%) \\ &= +0.7\% \\ \% \Delta R &= -1\% + 0.7\% \\ &= -0.3\% \end{aligned}$$

4. Due to the bad publicity Uber suffered by charging surge pricing during emergencies like Super Storm Sandy and the Sydney hostage crisis, it has pledged to refrain from surge pricing in future emergencies. Under which of the following estimated supply elasticities of supply for Uber services is Uber's policy likely to be the most harmful to consumers?

- A. 0
- B. 3.2
- C. 4
- D. 1.8
- E. There is not enough information to answer the problem.



5. Cars and motorcycles are substitutes. A technological breakthrough improves production technology for cars, reducing their marginal cost of production. Which of the following statements are likely to be correct about the new equilibrium compared with the old equilibrium before the technological breakthrough?

- i) Quantity of cars bought in the new equilibrium is larger ✓
- ii) Quantity of motorcycles bought in the new equilibrium is smaller ✓
- iii) Prices of both cars and motorcycles will be lower in the new equilibrium ✓

A. (i) and (ii)

B. (ii) and (iii)

C. (i) and (iii)

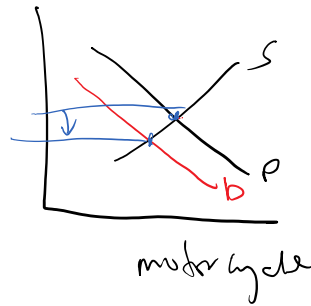
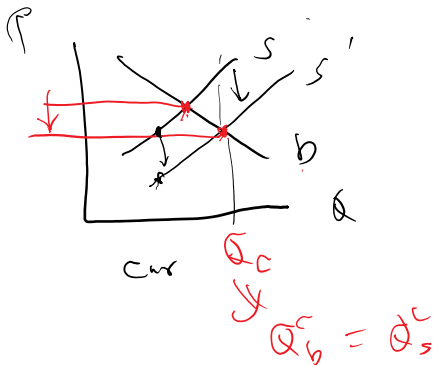
D. (i), (ii), and (iii)

$$s_c \downarrow \rightarrow (P_c \downarrow \ \& \ \underline{Q_c \uparrow})$$

$$\rightarrow Q_m \downarrow \text{ (subs)}$$

$$\rightarrow D_c \downarrow$$

$$\rightarrow (P_m \downarrow \ Q_m \downarrow)$$



6. Einstein's sells cups of coffee and bagels in Founders Hall at prices of \$1.00 and \$2.00, respectively. At those prices, Einstein's sells 5000 cups of coffee and 800 bagels per day. Einstein's faces a constant marginal cost for each cup of coffee of 10 cents and a constant marginal cost of a bagel is also 50 cents. Einstein increases the price of coffee 10%, to \$1.10. After the price increase, Einstein's sells 4500 cups of coffee, a decrease of 10% cups of coffee. Demand for coffee at Einstein's at this price interval is best described as:

- A. Elastic
- B. Inelastic
- C. ~~Unitary Elastic~~
- D. Perfectly Elastic
- E. Super Duper Inelastic X

$$\left. \begin{array}{l} Q_1 = 5000 \\ Q_2 = 4500 \end{array} \right\} \Delta Q = -500$$

$$e_D = \frac{\% \Delta Q}{\% \Delta P} = \frac{-10\%}{+10\%} = -1$$

$$\% \Delta Q = \frac{Q_2 - Q_1}{Q_1} = \frac{4500 - 5000}{5000} = \frac{-500}{5000} = -10\%$$

| Q | | P |

	Q	P
1	500	1.00
2	450	1.10
% Δ	$\frac{450 - 500}{500}$ = -10%	$\frac{1.10 - 1.00}{1.00}$ = 10%

$$E_D = \frac{\% \Delta Q}{\% \Delta P} = \frac{-10\%}{10\%} = -1 \text{ (unit)}$$

7. Assume the same facts as the previous question. What is the difference between Einstein's coffee profits before and after the price increase?

- A. \$1000 greater profit before
- B. \$500 greater profit before
- C. 0
- D. \$500 greater profit after
- E. \$1000 greater profit after

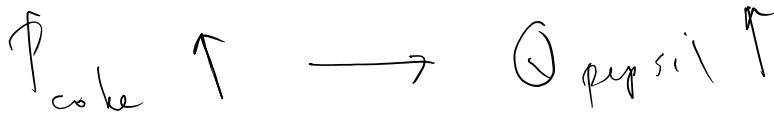
	Q	P	Rev = P Q	Cost = $nc \cdot Q$	Profit = Rev - Cost
before	500	1.00	500	$.10(500) = 50$	= 450
after	450	1.10	495	$.10(450) = 45$	= 450

⇒ Profit is same

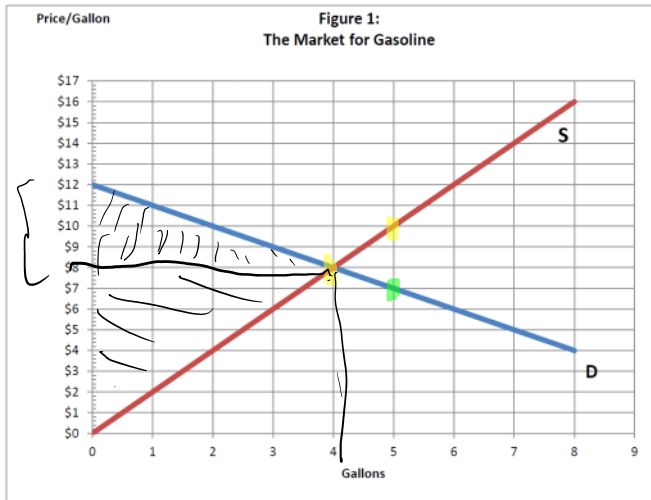
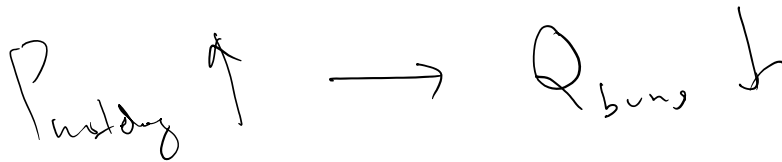
8. After Einstein increases the price for coffee, the number of bagels Einstein sells increases from 800 to 900. Which best describes the demand relationship between bagels and coffee?
- A. Substitutes
 - B. Giffen goods
 - C. Complements
 - D. Public goods



subs:



complements:



	Q	P
1	4	8
2	5	10
2.5	$\frac{5-4}{4} = 25\%$	$\frac{10-8}{8} = 25\%$

$$e_s = \frac{25\%}{25\%} = 1$$

Refer to Figure 1 for questions 9-14 In Figure 1, S= Market Supply Curve; D = Market Demand Curve.

9. At the market equilibrium price, is demand or supply more elastic?
- A. Demand is more elastic
 - B. Supply is more elastic
 - C. Neither, both elasticities are equal in a competitive equilibrium
 - D. Demand and supply elasticities are always equal in competitive equilibrium
 - E. C and D

	Q	P
1	4	8
2	5	7

2	5	7
$\% \Delta Q$	25%	$\frac{7-5}{5} = 40\%$

$$e_b = \frac{\% \Delta Q}{\% \Delta P} = \frac{25\%}{-12.5\%} = -2$$

$\Rightarrow D$ is more elastic than supply

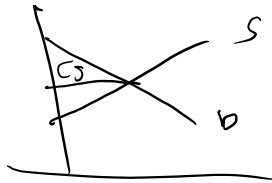
10. What is consumer welfare at the competitive market equilibrium price and quantity?

- A. \$16
- B. \$12
- C. \$8
- D. \$4
- E. \$0

CS = area below D, above price up to Q.

CS = $\frac{1}{2}bh$ for triangle

$$CS = \frac{1}{2}(4)(4) = 8$$



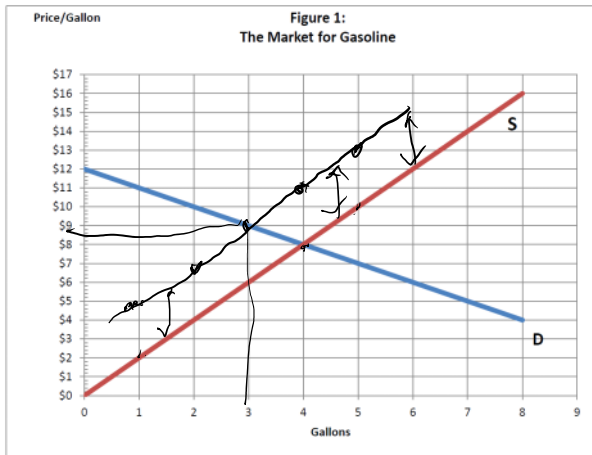
11. What is producer surplus at current competitive market equilibrium prices?

PS = area above P, below S up to Q

$$PS = \frac{1}{2}(8)(4) = 16$$

12. Suppose the marginal cost of a gallon of gasoline increases by \$3 for all gas stations in the market. The new equilibrium price and quantity are:

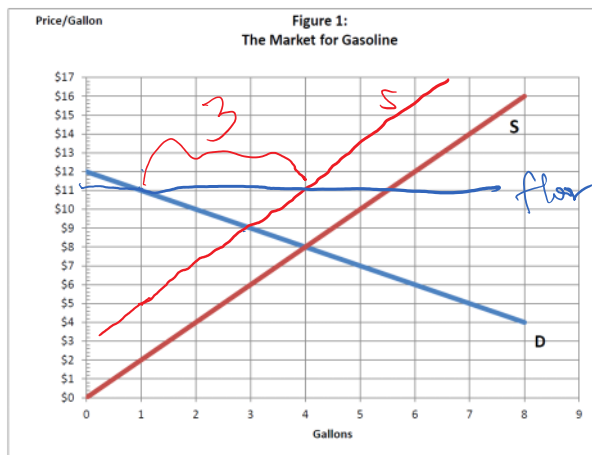
- A. \$10 and 4 gallons
- B. \$9 and 3 gallons
- C. \$10 and 5 gallons
- D. \$9 and 2 gallons
- E. \$11 and 4 gallons



13. After the market changes in question 47 above, assume that the government enacts a price floor of \$11. What will happen in the market?

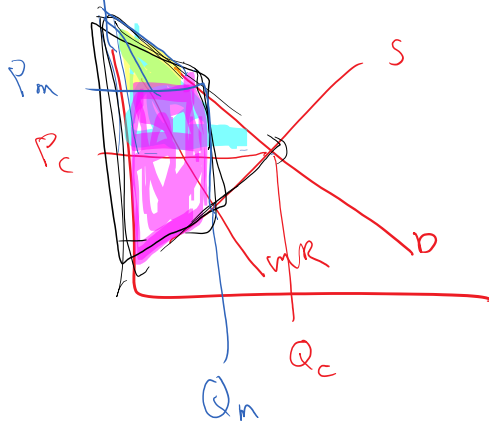
- A. Quantity supplied will equal quantity demanded at a price of \$11.
- B. There will be a surplus of 1 gallon.
- C. There will be a surplus of 2 gallons.
- D. There will be a surplus of 3 gallons.
- E. There will be a shortage of 2 gallons.

At $P = 11$, $Q_S = 4$, $Q_D = 1$
 \Rightarrow surplus of $4 - 1 = 3$



14. Assume the suppliers in the market for gasoline characterized by Figure 1 are able to successfully collude. Which of the following is TRUE:

- A. Consumer surplus would remain the same, but producer surplus would increase, and total efficiency would increase.
- B. Consumer surplus would fall, and producer surplus would increase, and total efficiency would remain the same.
- C. Consumer surplus would fall, producer surplus would increase, and total efficiency would decrease.
- D. Consumer surplus would increase, producer surplus would fall, and total efficiency would increase.
- E. None of the above.



$$CS \downarrow, PS \uparrow$$
$$TW = CS + PS \downarrow$$

Sunday 5pm