

Please write your answers neatly and legibly.

1. (1 point) Alice goes to the store and purchases \$135 worth of groceries. In her grocery bag there is \$10 worth of cheese produced this year in France; \$20 worth of mangoes from a tropical country; \$25 worth of beef produced this year in Texas; \$15 worth of paper goods produced this year in Appleton, WI; and \$40 worth of brats and hotdogs produced in Madison, WI. Given these expenditures and holding everything else constant, what is Alice's contribution measured in dollars to the following given these purchases?

Alice's contribution to GDP in the U.S. this year = \_\_\_\_\_

Alice's contribution to consumption spending in the U.S. this year = \_\_\_\_\_

**Answer:**

Consumption spending increases by the full \$135 that Alice spends at the grocery store. However, GDP only goes up by \$105 since GDP measures domestic production and the \$10 of French cheese and \$20 of mangoes from a tropical country are not actually being produced in the U.S. this year. In GDP accounting, this \$30 would be counted as imports and would be subtracted from the total of expenditure in the economy to reach GDP. So, to recap:

Alice's contribution to GDP in the U.S. this year = \_\_\_\_\_ \$105 \_\_\_\_\_

Alice's contribution to consumption spending in the U.S. this year = \_\_\_\_\_ \$135 \_\_\_\_\_

2. (5 points: 1/2 point for each answer and 1/2 point for each explanation) Maury this week writes five checks. The first check is made out to "Maude Rivers" as payment for cleaning services Maude provides to Maury. Maury does not report this payment to any government authority and Maude does not report this payment to the Internal Revenue Service. The second check is made out to "Ace Awnings" a company that has provided tents for outdoor celebrations for the last fifty years. The third check is made out to "Bill's Auto Shop" as payment for a hit-and-run accident that Maury experienced last week that destroyed the right side of his car. The fourth check is to "Bob Miller" and represents a contribution to a neighborhood group that sponsors a low-key party each summer. The fifth check is to "Jane Doe" and is a payment to Jane for legal services that she rendered in drawing up an updated will for Maury. Determine whether the dollar amount of each of these checks is part of the economy's GDP calculation for the year. Fill in your answers ("counted in GDP", "NOT counted in GDP") in the provided blanks. Then provide a short explanation for your answer.

First check to Maude Rivers: \_\_\_\_\_

Explanation:

Second check to Ace Awnings: \_\_\_\_\_

Explanation:

Third check to Bill's Auto Shop: \_\_\_\_\_  
Explanation:

Fourth check to Bob Miller: \_\_\_\_\_  
Explanation:

Fifth check to Jane Doe: \_\_\_\_\_  
Explanation:

Answer:

First check to Maude Rivers: \_\_\_\_\_ Not counted in GDP \_\_\_\_\_  
This transaction is not part of the legal economy and therefore does not get counted.

Second check to Ace Awnings: \_\_\_\_\_ Counted in GDP \_\_\_\_\_  
This is a legitimate business and therefore this transaction gets counted in GDP.

Third check to Bill's Auto Shop: \_\_\_\_\_ Counted in GDP \_\_\_\_\_  
This is a legitimate business and therefore this transaction gets counted in GDP. The hit-and-run aspect of the accident is just a distractor: the issue is that protective services –in this case, auto repair–was provided by a legal business.

Fourth check to Bob Miller: \_\_\_\_\_ Not counted in GDP \_\_\_\_\_  
This is a payment for an informal activity that is not part of the legal economy.

Fifth check to Jane Doe: \_\_\_\_\_ Counted in GDP \_\_\_\_\_  
This is a payment for legal services rendered this year to Maury. This is part of the legal economy.

3. Consider the market for cellphones in an economy that can be described by the following demand and supply equations where P is the price per cellphone in dollars and Q is the number of cellphones:

$$\text{Demand Curve: } Q = 5000 - 10P$$

$$\text{Supply: } Q = 10P - 1000$$

- a. (1 point) Given the above information, calculate the value of consumer surplus (CS) and producer surplus (PS) in this market. Show your work and provide units of measurement in your answer. Put your answers in the provided blanks.

$$\text{CS} = \underline{\hspace{2cm}}$$

$$\text{PS} = \underline{\hspace{2cm}}$$

Answer:

To find the CS and PS you must first find the equilibrium price and quantity:

$$5000 - 10P = 10P - 1000$$

$$6000 = 20P$$

$P_e = \$300$  per cellphone

$Q_e = 5000 - 10(300) = 2000$  cellphones

Or,  $Q_e = 10(300) - 1000 = 2000$  cellphones

Then, you must also find the y-intercepts for both the demand and supply curves: the y-intercept for the demand curve is \$500 and the y-intercept for the supply curve is \$100. Here's the final calculation:

$CS = (1/2)(\$500 \text{ per cellphone} - \$300 \text{ per cellphone})(2000 \text{ cellphones}) = \$200,000$

$PS = (1/2)(\$300 \text{ per cellphone} - \$100 \text{ per cellphone})(2000 \text{ cellphones}) = \$200,000$

CS = \_\_\_\_\_ \$200,000 \_\_\_\_\_

PS = \_\_\_\_\_ \$200,000 \_\_\_\_\_

- b. (3 points: 1/2 point for each answer and its required work) Suppose the government in this economy decides that there are too many cellphones. The government passes legislation that limits the total number of cellphones to 1000. Given this legislation, compute the following values. Show your work and include your units of measurement in your answers.

Number of cellphones sold in market = \_\_\_\_\_

Price of cellphone in this market = \_\_\_\_\_

CS given this legislation = \_\_\_\_\_

PS given this legislation = \_\_\_\_\_

Deadweight Loss (DWL) given this legislation = \_\_\_\_\_

Total gain or loss in PS due to this program relative to no government intervention in the market = \_\_\_\_\_

Answer:

The government is limiting the number of cellphones to 1000 cellphones which is less than the equilibrium quantity in this market. So, in order for only 1000 cellphones to be demanded, consumers must be charged \$400 per cellphone. To see this, plug  $Q = 1000$  into the demand equation:  $Q = 5000 - 10P$  or  $1000 = 5000 - 10P$  or  $P = \$400$  per cellphone.

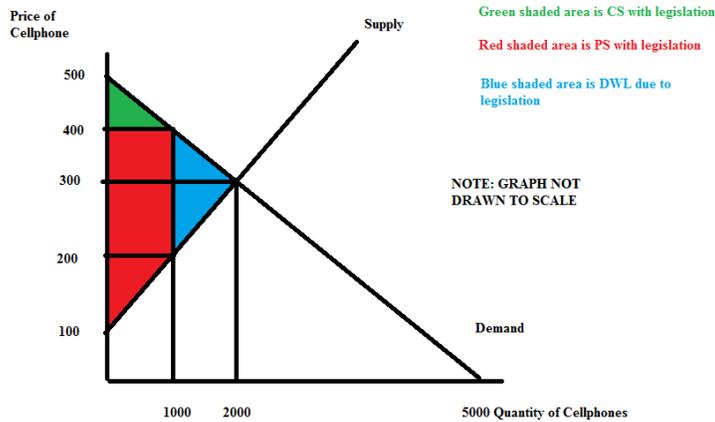
CS is the area under the demand curve and above the price consumers pay. Thus,  $CS = (1/2)(\$500 \text{ per cellphone} - \$400 \text{ per cellphone})(1000 \text{ cellphones}) = \$50,000$ .

PS is the area under the price producers receive and above their supply curve: in this case PS is the sum of a rectangle and a triangle.  $PS = (1/2)(\$200 \text{ per cellphone} - \$100 \text{ per cellphone})(1000 \text{ cellphones}) + (\$400 \text{ per cellphone} - \$200 \text{ per cellphone})(1000 \text{ cellphones}) = \$50,000 + \$200,000 = \$250,000$ .

$DWL = (1/2)(\$400 \text{ per cellphone} - \$200 \text{ per cellphone})(2000 \text{ cellphones} - 1000 \text{ cellphones}) = \$100,000$ .

PS initially before this legislation was equal to \$200,000 and now it is equal to \$250,000. There is a gain in PS of \$50,000.

Here is a graph representing these computations:



Number of cellphones sold in market = \_\_\_\_\_ 1000 cellphones \_\_\_\_\_

Price of cellphone in this market = \_\_\_\_\_ \$400 per cellphone \_\_\_\_\_

CS given this legislation = \_\_\_\_\_ \$50,000 \_\_\_\_\_

PS given this legislation = \_\_\_\_\_ \$250,000 \_\_\_\_\_

Deadweight Loss (DWL) given this legislation = \_\_\_\_\_ \$100,000 \_\_\_\_\_

Total gain or loss in PS due to this program relative to no government intervention in the market =  
\_\_\_\_\_ Gain of \$50,000 \_\_\_\_\_