1. If the production and sale of a good causes a positive externality, the total profits of buyers and sellers are maximized by a competitive equilibrium.

Answer: False

Suppose a market is in competitive equilibrium with a price of $20. Further suppose that some buyers have a buyer value of $18, some sellers have a seller cost of $22, and the good creates a positive externality of $5. The buyers with an $18 value won't buy, and the sellers with a $22 cost won't sell. However, if an $18 buyer bought from a $22 seller, total profits would increase by $1

$$(= \$18 - \$22 + \$5)$$

2. If the production and sale of a good causes a negative externality, a tax on the sale of that good can increase total profits.

Answer: True

Suppose a market is in competitive equilibrium with a price of $20. Further suppose that some buyers have a buyer value of $22, some sellers have a seller cost of $18, and the good creates a negative externality of $5. If a transaction between a $22 buyer and an $18 seller were cancelled, total profits would increase by $1. a tax of $5 would eliminate such transactions

3. Residents of the town of Los Locos (population 100) like to drive noisy offroad vehicles, but they hate the disturbance and dust caused by each others' vehicles. Each vehicle that is purchased by a resident causes $20 worth of damage to each of the 100 residents. There are 20 residents who are willing to pay up to $4,000 for an offroad vehicle. There are 30 residents who are willing to pay up to $3,000 for an offroad vehicle and there are 50 residents who are willing to pay up to $2,500 for an offroad vehicle. The price of offroad vehicles is $1,200. In the absence of any governmental interference, how many residents of Los Locos would buy offroad vehicles?

(a) 0
(b) 20
(c) 50
(d) 80
(e) 100

Answer: E
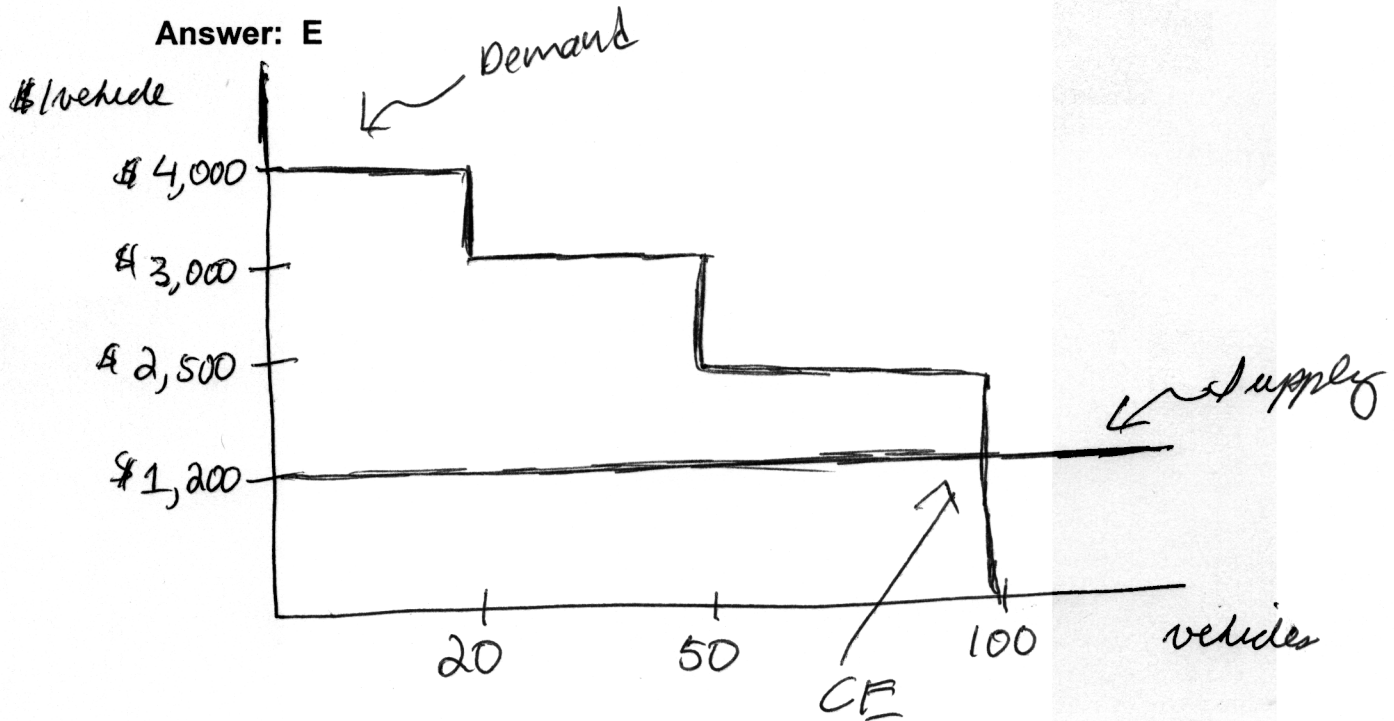
4. In the town of Los Locos described in question 3, how many residents would support a ban on offroad vehicles?

(a) 0
(b) 20
(c) 50
(d) 80
(e) 100

Answer: D

Pollution cost per resident = $20 × 100 = $2,000

Profits:

$4,000 buyer:
$4,000 − $1,200 − $2,000 = $800

$3,000 buyer:
$3,000 − $1,200 − $2,000 = − $200

$2,500 buyer
$2,500 − $1,200 − $2,000 = − $700

5. Suppose that the town of Los Locos imposes a tax of $2,000 on every resident who buys an offroad vehicle and the town distributes the revenues collected from the tax equally among all residents of Los Locos. With the tax in place, how many people in Los Locos will buy offroad vehicles and how much tax revenue will the government distribute to each resident?
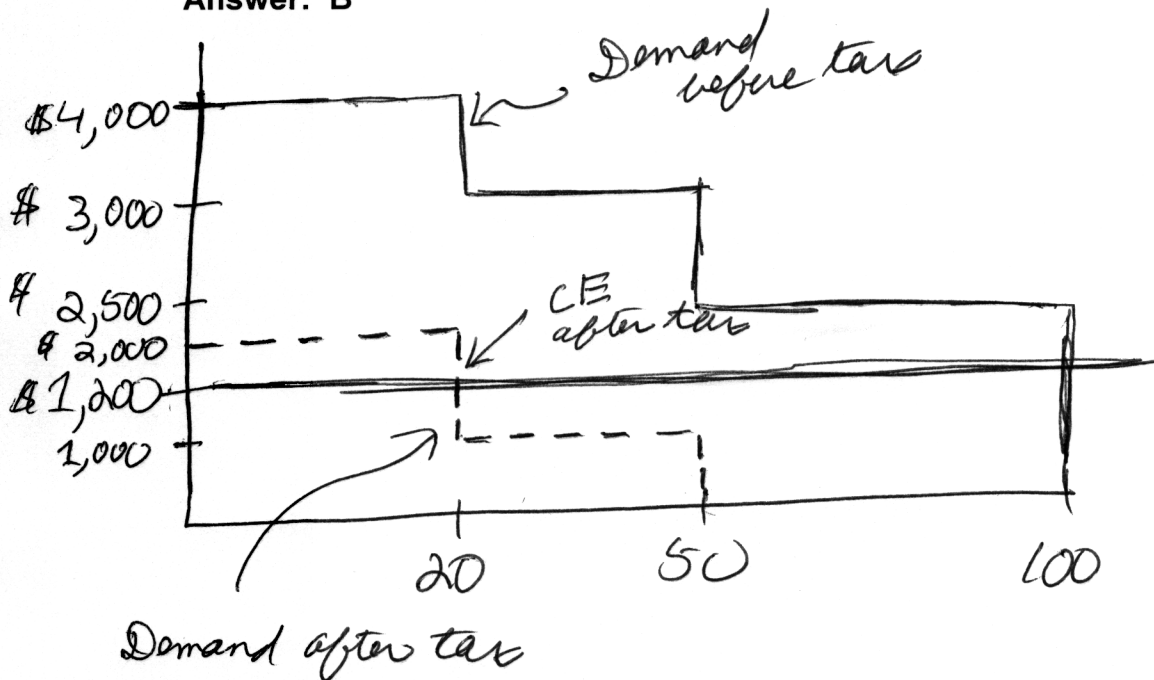**(a) 50 residents will buy offroad vehicles and each resident will get a rebate of 1,000.**
(b) 20 residents will buy offroad vehicles and each resident will get a rebate of $400.
(c) Nobody will buy an offroad vehicle and there will be no rebates.
(d) Everybody will buy an offroad vehicle and everyone will get a rebate of $2,000.
(e) None of the above.

Answer: B

after the tax, 20 residents will buy vehicles

$$Rebate = \frac{20 \times \$2,000}{100} = \$400$$

6. The residents of Los Locos decided to vote on whether to impose a tax of $2,000 on each offroad vehicle purchaser. Who would gain and who would lose from the tax on offroad vehicles?
(a) The residents with $2,500 buyer values would be better off and the other residents would be worse off.
(b) Every resident would be worse off.
(c) The residents with $4,000 buyer values would be better off and the other residents would be worse off.
(d) The residents $4,000 buyer values would be just as well off and other residents would be better off.
(e) The residents with $4,000 buyer values would be worse off, the residents with $3,000 buyer values would be exactly as well off, and the residents with $2,500 buyer values would be better off.

Answer: D

The pollution damage per resident = $20 × 20
 = $400

The rebate = $400

The damage minus rebate = zero.

Profits for $4,000 buyer:
 $4,000 − $1,200 − $2,000 = $800

Profits for $3,000 buyer:
 zero (They don't buy)

Profits for $2,500 buyer: zero.

Compare with answer to Question 4.

7. Sweet Harmony, Oregon has 100 families. Forty of those families have a child, and 60 do not. Twenty of the families with a child are willing to pay as much as $6,000 to educate their child, and the other twenty are willing to pay as much as $4,000. Each educated child creates a positive externality of $25 for each family in Sweet Harmony. The cost of educating a child is $5,000. If each family must pay the cost of educating its child, what is the total profit all families derive from the education of Sweet Harmony's children?

(a) $30,000
(b) $40,000
(c) $70,000
(d) $100,000
(e) $120,000

Answer: C

Twenty families ($6,000 BV) educate their children, producing an external benefit of $500 per family. Profits are:

	profit per family	#	total profit
$6,000 BV	$6,000 − $5,000 + $500 = $1,500	20	$30,000
$4,000 BV	$500	20	$10,000
w/o children	$500	60	$30,000
total			$70,000

8. The town council of Sweet Harmony is considering a proposal to provide a free public education to all children in the town. The total cost of this proposal would be $200,000 ($5,000x40). To finance this cost, the council would tax each family $2,000. If this proposal were enacted, what would be the total profit to the residents of Sweet Harmony from educating its children?
(a) $30,000
(b) $40,000
(c) $70,000
(d) $100,000
(e) $120,000

Answer: D

all families educate their children producing an external benefit of $1,000 per family.

Profits are:

	profit per family	#	Total profit
$6000 BV	$6,000 - $2,000 + $1,000 = $5,000	20	$100,000
$4,000 BV	$4,000 - $2,000 + $1,000 = $3,000	20	$60,000
w/o kids	- $2,000 + $1,000 = - $1,000	60	-$60,000
Total			$100,000

Or think of it this way. We educate 20 more kids. Each family is willing to pay $4,000. In addition, educating a child produces $2,500 in external cost benefit. The cost is $5,000 for a net benefit of $1,500 per kid. There are 20 more kids educated, so total profits are $30,000 higher.

9. If the proposal for free public schools in Sweet Harmony were put to a vote, how many families would vote in favor of it?

(a) 20
(b) 40
(c) 60
(d) 80
(e) 100

Answer: B

Compare the tables in questions 7 and 8. Families with children are better off with free public schools; families without children are worse off. So, only families with children would favor public schools (40 of them) even though total profits are higher with public schools than with private schools. It's all about the distribution of profits.

10. Another proposal is to pay each family a subsidy $1,200 if they pay for their child's education. The school would still cost each family $5,000 for a net cost after the subsidy of $3,800. The subsidy would be financed by a tax on residents. How many families would favor this proposal over the status quo described in question 7?

(a) 20
(b) 40
(c) 60
(d) 80
(e) 100

Answer: E

All families would send their children to public schools so external benefits are the same. The tax is $\dfrac{\$1,200 \times 40}{100} = \$4.80$

Profits are:

	profit per family	#	total profit
$6000 BV	$6,000 3,800 − 480 + 1000 = $2,720	20	54,400
$4000 BV	$4,000 − 3,800 − 480 + 1000 = $720	20	14,400
no kids	−480 + 1000 = $520	60	$ 31,200
			$100,000

Now compare everyone's profit with the profit in question 7. Everyone has higher profit so this proposal would pass. But the total profit is the same as with public education as described in question 8. Get the message?