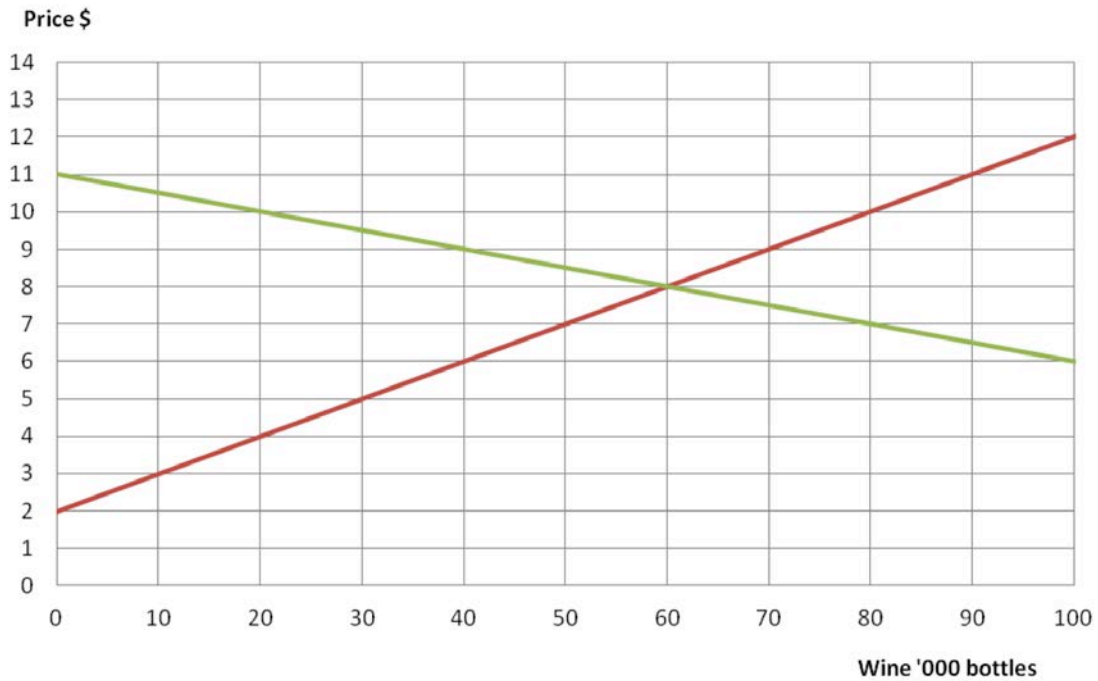


3. (5 points) Last year, Acme signed a four year leasing contract for a new retail store for \$2M total. At that time, the forecast for revenues minus operating costs was \$4M over the four years. Based on that forecast, Acme has now already undertaken \$1.5M of renovation.

Recent updated forecasts suggest that revenues minus operating costs will actually be \$2.5M over the four years, and that Acme would need to undertake an additional \$1M in renovation in order to open the store. Given this new information, should Acme continue with its decision to open this store? Explain your reasoning.

4. (5 points) An insurance company sells medical insurance for dogs, charging dog owners a premium of \$10 per month so long as they enroll their dog within the first two months of ownership. If they begin enrollment after two months, their insurance premiums rise by \$1 for each month that enrollment is delayed. So, a delay of 12 months raises the monthly premium to \$22. Explain why the insurance company has this pricing structure.

- 5 (15 points) The market for wine is perfectly competitive and the graph below shows the monthly supply and demand. The government currently imposes a \$3 per bottle tax on wine producers.

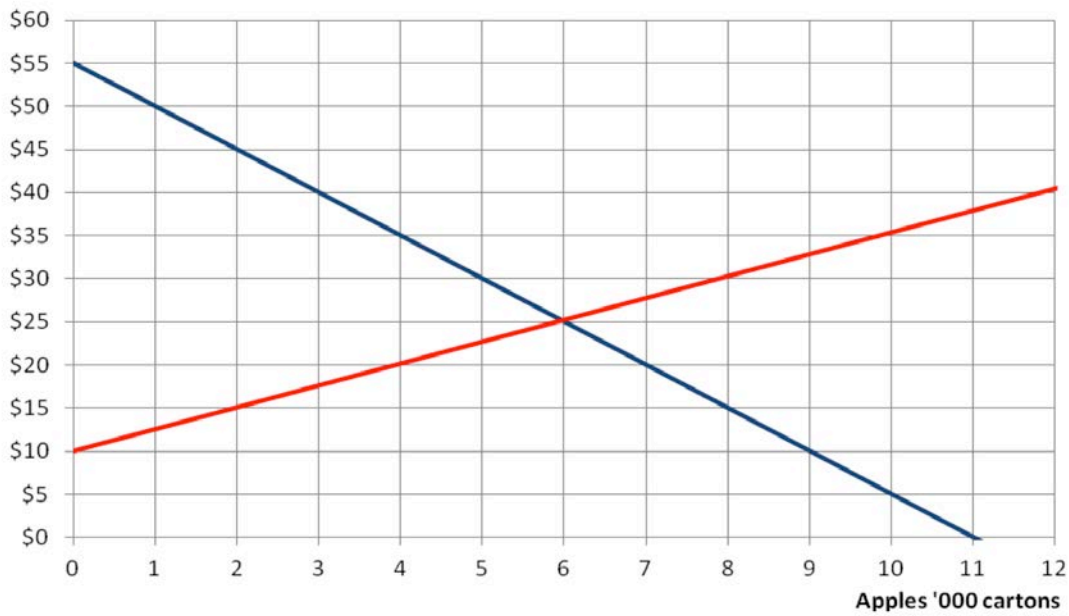


- A. What price is paid by consumers in this taxed market?
- B. How much wine is sold in this taxed market?
- C. Who bears the burden of this tax? Be specific and explain your reasoning.

D. What is the deadweight loss induced by this tax?

E. How would your answer to part C change if the \$3 tax were imposed on consumers rather than producers? Explain

6. (15 points) The graph below shows the annual domestic supply and demand for apples in Applestan. There are also a large number of apple producers operating in other countries and the world price of apples is \$35 per carton.



- A. Suppose Applestan were able to engage in international trade. Illustrate this outcome on the graph.
- B. What would be the price of apples sold in Applestan under free trade?
- C. How much apple would be produced in Applestan under free trade?
- D. How much apple would be consumed in Applestan under free trade?
- E. How much apple would Applestan import or export under free trade?

F. Applestan is, however, surrounded by high mountains and lacks the transportation infrastructure to get its apples to the world market. Suppose that the necessary infrastructure would cost \$40,000 annually. Would Applestan's apple producers be willing to pay for this infrastructure? Explain your reasoning.

G. Is the outcome you describe in part F efficient for Applestan? Explain.

7. (15 points) Consider a perfectly competitive market with many identical firms. A typical firm incurs a fixed cost of \$200 each month and its monthly production function is provided below.

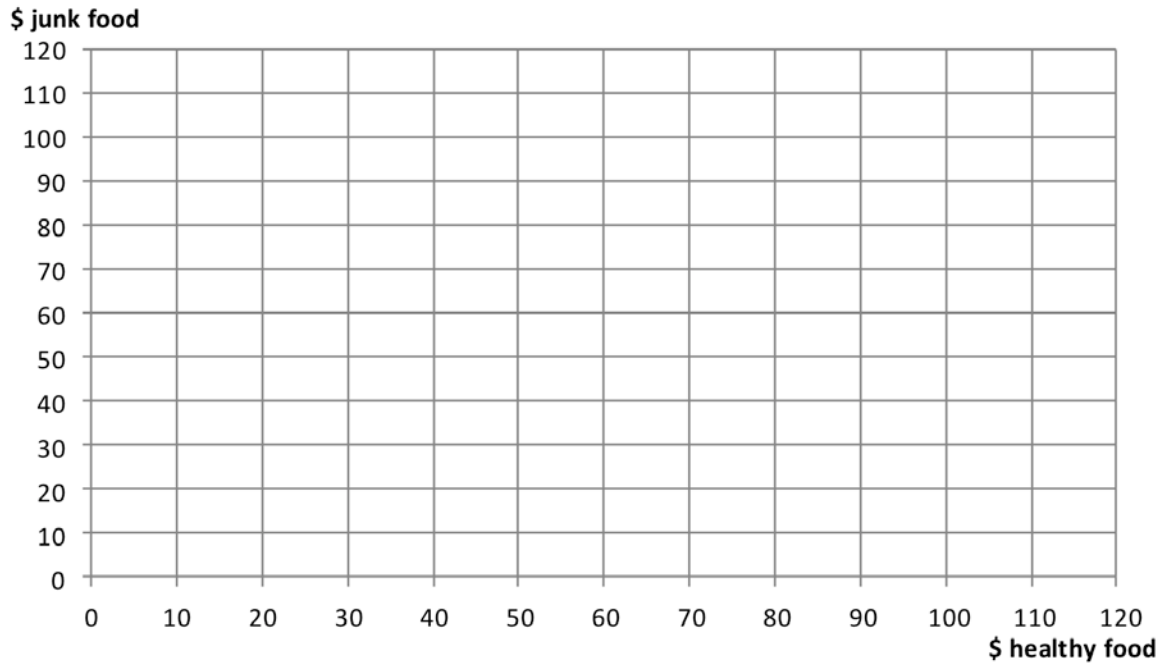
Output	Total variable cost
0	0
1	60
2	100
3	120
4	150
5	210
6	280
7	370
8	480

- A. What is the long run equilibrium price in this market? Use the additional space in the table to make any relevant calculations. Explain your reasoning.
- B. What quantity does the firm produce each month in the long run market equilibrium?

- C. Suppose the government imposes a price ceiling of \$50 per unit. How many units would the firm produce in the next month?
- D. Will consumers be better off if the price ceiling is adopted? Explain.
- E. Describe what happens to this industry over time if the price ceiling persists. What is the new long run equilibrium price and quantity with the price ceiling?

8. (10 points) Alfie has \$100 per week to spend solely on food and he can choose between junk food or healthy food. Alfie currently spends \$50 per week on junk food and \$50 on healthy food.

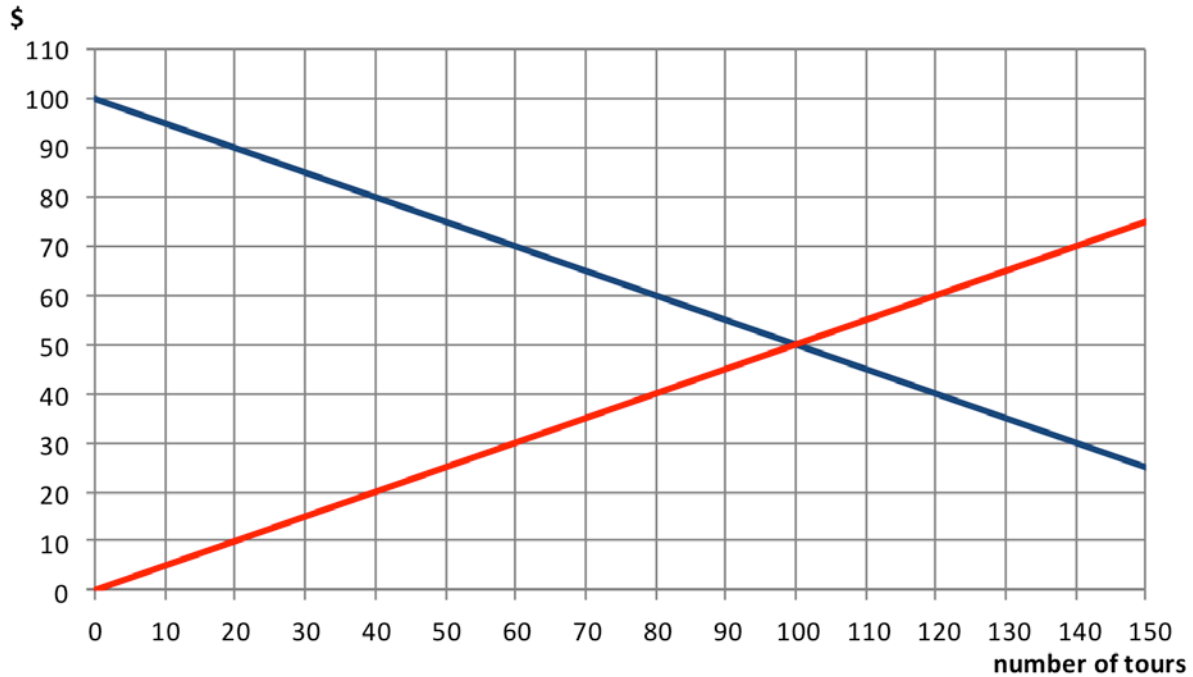
A. Draw Alfie's budget constraint on the graph below.



B. Concerned with the adverse health effects of junk food, the mayor imposes a new tax on junk food such that \$1 will only purchase \$0.80 worth of junk food. Draw Alfie's new budget constraint after this junk food price increase. Label clearly.

C. Will Alfie's consumption of healthy food increase as a result of the tax? Explain using the concepts of income and substitution effects.

9. (15 points) The graph below shows the monthly supply and demand for wildlife tours in a National Park. The wildlife tour industry is perfectly competitive. The Parks Department recently determined that the first 40 wildlife tours each month do no harm to the park. However, beyond 40 tours, each additional tour does damage that requires an extra \$20 of clean-up and maintenance.

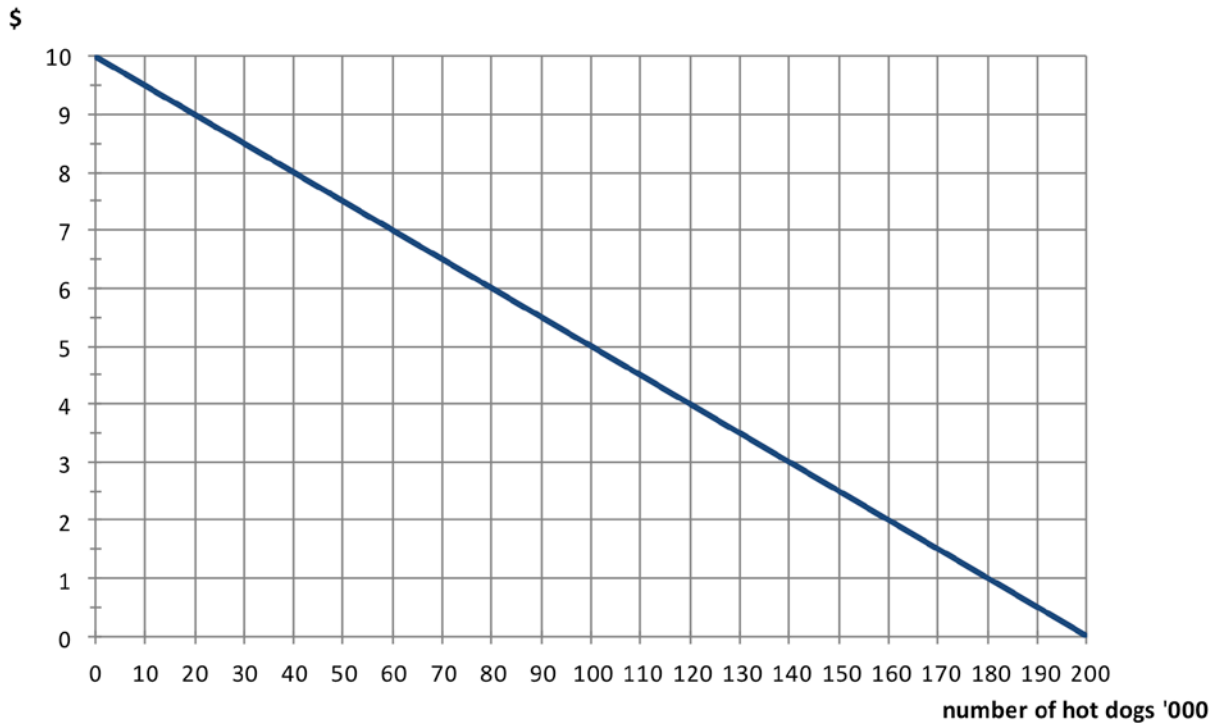


- A. Use the graph to explain how many tours would be efficient.
- B. If the market for tours is unregulated, how many wildlife tours are conducted each month?

C. Would it be more efficient to cap the number of tours at 40 per month, rather than allow the unregulated outcome from part B? Explain using the graph.

D. What size tax would lead to the efficient outcome you described in part A?

10. (10 points) A city government is preparing to sell a single annual exclusive license to operate hot dog stands inside a stadium. The graph below shows the annual demand for hot dogs inside the stadium. The fixed cost of operating the hot dog stands is \$100,000 per year, and each hot dog incurs a marginal cost of \$1.



- A. The license holder is required to charge a single price for all hot dogs inside the stadium. What price is charged?
- B. How many hot dogs will be sold inside the stadium each year?
- C. What is the maximum price that the city could charge each year for this exclusive license? Explain your reasoning.

Suggested Answers

1.

*% change in quantity demanded of cigarettes = $(-0.30 * 0.5) = 15\%$ decline.*

2.

The park is not non-excludable (i.e., it is excludable) since the Parks Dept. could easily erect a tall fence to keep people out. The park is non-rival and thus a public good when it is not congested. But when there are many people in the park, it becomes more like a private good.

3.

The \$1.5m on renovations and the \$2m rental commitment are sunk costs.

Going forward, profits, ignoring any opportunity cost of the space = $2.5M - 1M = \$1.5M$.

So long as Acme can't sublease the space for more than \$1.5M (or find other alternative uses that would generate more than \$1.5M), it makes sense for them to continue to open.

4.

The insurance company is trying to combat the incentive for owners to delay enrollment until they know their dog needs veterinary care. Owners likely won't know within two months of ownership whether their dog is healthy or will need lots of veterinary services. The increasing premium incentivizes owners to enroll before they have this private information, thus preventing an adverse selection of risks for the insurance company.

5.

A. \$9

B. 40,000.

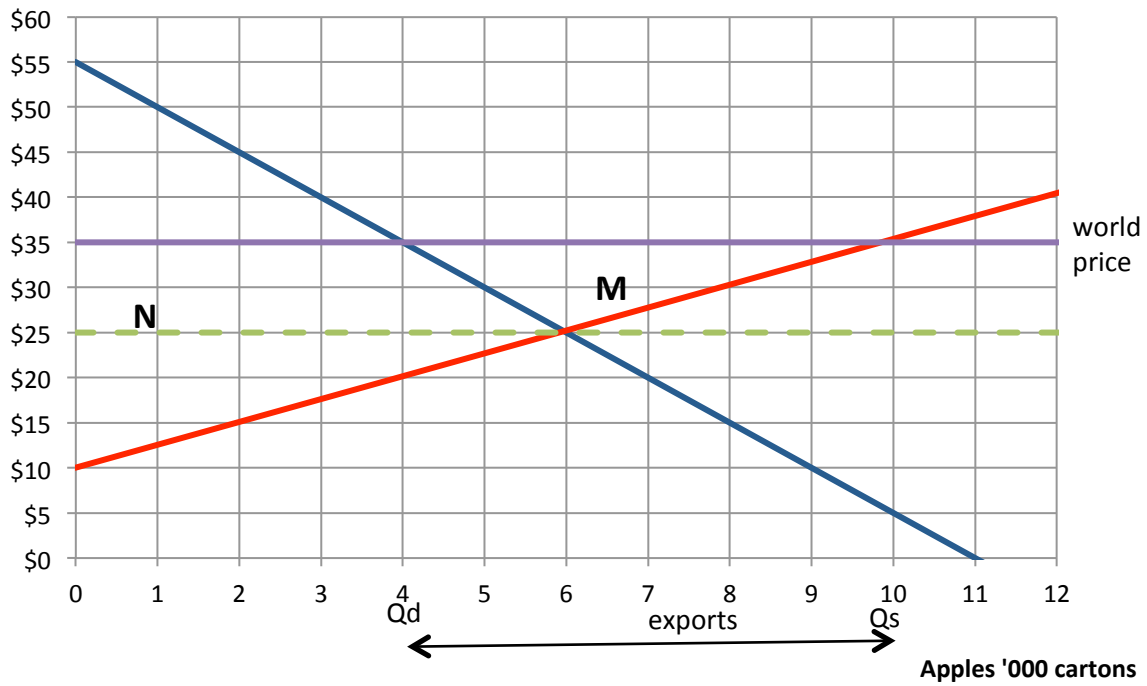
C. *Pretax, consumers pay \$8. Post-tax they pay \$9. So consumers bear \$1 of the \$3 tax.*

Pretax, producers receive \$8. Post-tax they receive \$6. So producers bear \$2 of the \$3 tax.

D. *$DWL = \frac{1}{2} * 3 * (60000 - 40000) = \$30,000$*

E. *There is no change - the economic incidence of a tax is not affected by the legal incidence.*

6.
A.



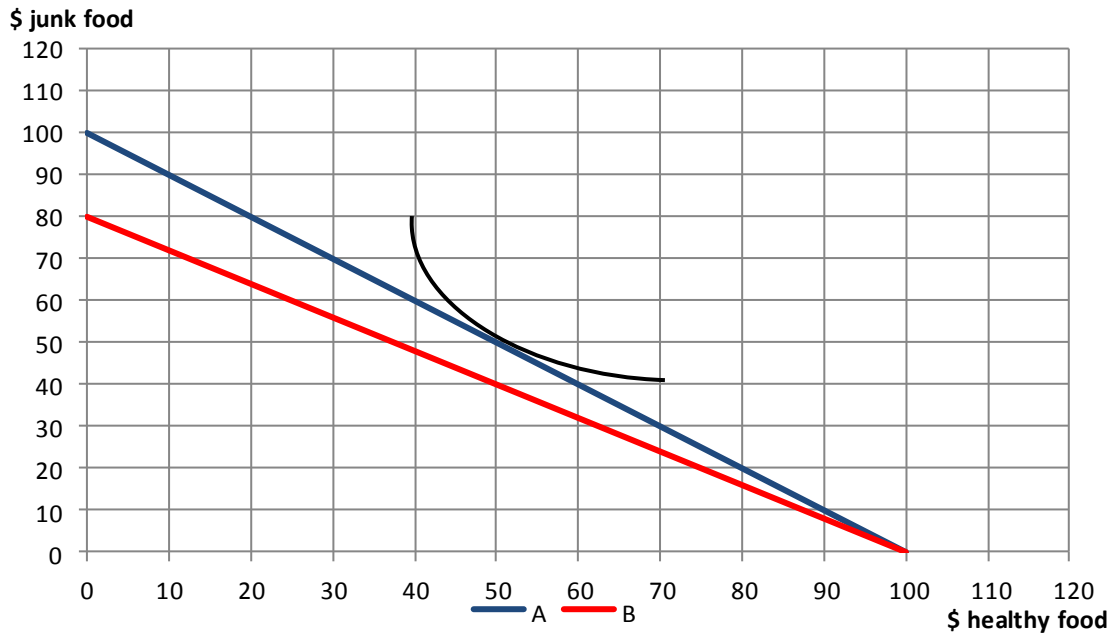
- B. \$35
 C. 10,000 cartons
 D. 4,000 cartons
 E. 6,000 cartons exported
 F. Yes. Producers would be willing to pay since their gain in producer surplus = areas M and N = \$80,000 annually, which is greater than the \$40,000 infrastructure.
 G. No. The net gain in surplus from trade = \$30,000 annually, which is less than the \$40,000 infrastructure.

7.

Output	Total variable cost	TC	AVC	ATC	MC
0	0	200	---	---	
					60
1	60	260	60	260	
					40
2	100	300	50	150	
					20
3	120	320	40	106.7	
					30
4	150	350	37.5	87.5	
					60
5	210	410	42	82	
					70
6	280	480	46.7	80	
					90
7	370	570	52.9	81.4	
					110
8	480	680	60	85	

- A. \$80. This price is the minimum of ATC, so economic profit is zero and there is no incentive for entry or exit.
- B. 6 units.
- C. 4 units.
- D. In the short run, there will be a shortage. Consumers who are able to purchase at the lower price will be better off, but fewer units will be available and some consumers will be worse off because they can no longer consume.
- E. At a price of \$50, the firm operates in the short run but at a loss of \$50 below ATC. In the long run, this firm (and all others like it) will exit the market and production will be zero.

- 8.
- A.
- B.



C.

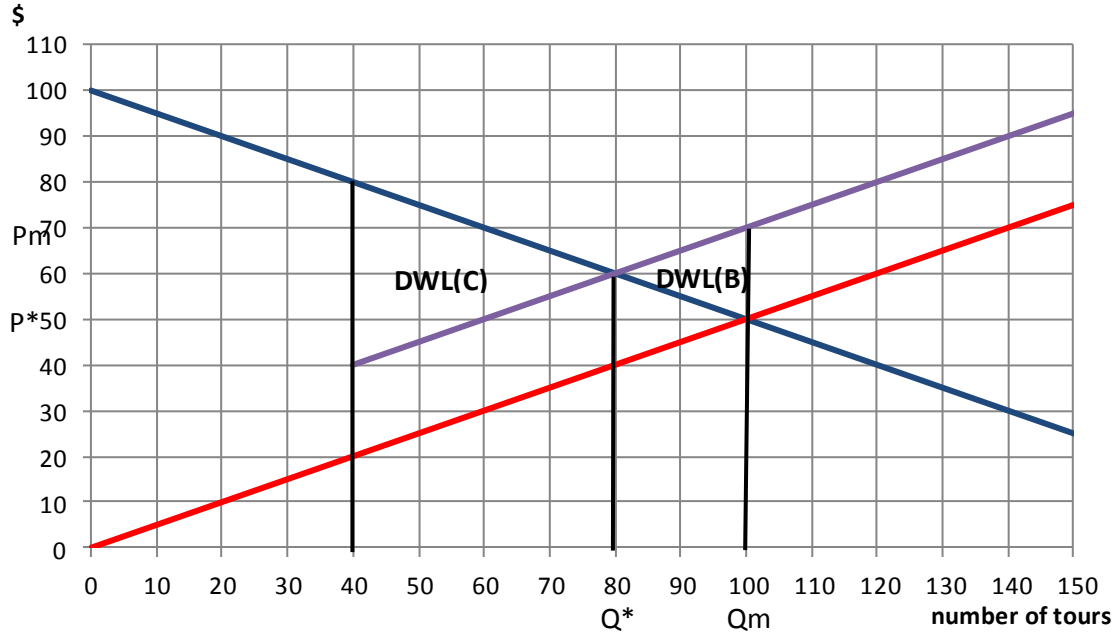
Maybe – it depends on Alfie’s preferences. The increase in junk food prices has two effects:

- *the substitution effect makes the consumption of healthy foods more attractive as it is now relatively cheaper.*
- *the income effect reduces the purchasing power of Alfie’s weekly food allowance which will reduce his consumption of all normal goods, including healthy food.*

Alfie will increase his consumption of healthy food if his preferences are such that the substitution effect dominates the income effect. If the income effect is larger then he will reduce his consumption of healthy food.

9.

- A. *After the 40th tour, tours incur an external cost such that the marginal social cost curve is \$20 above the supply curve that only represents private marginal costs. The efficient number of tours is where MB (as shown by the demand curve) is equal to MSC, i.e., 80 per month.*



B. *100 tours*

C. *No.*

The deadweight loss that results from the unregulated system is labelled as DWL(B).

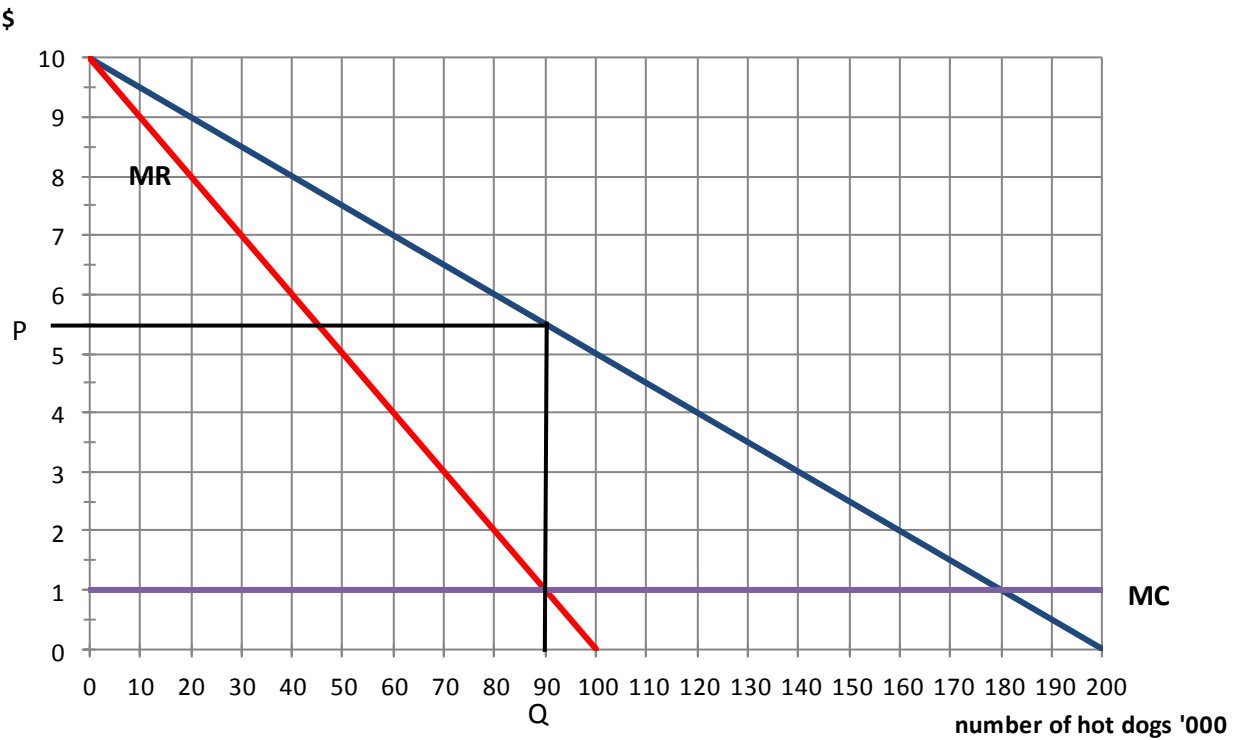
The deadweight loss that results from capping the tours at 40 is labelled DWL(C).

DWL(C) is clearly larger than DWL(B).

Thus, while capping the tours at 40 eliminates all damage to the park, it causes greater DWL than not correcting the externality at all.

D. *\$20 per tour*

10.



A. *The license holder is a monopolist and will set the price and quantity so that $MR=MC$.*

Price = \$5.50

B. *90,000*

C. *Annual profits (ignoring the license fee)* $= (P - MC) * Q - FC$
 $= (\$5.50 - 1) * 90,000 - 100,000$
 $= \$305,000$

Thus, the license holder would be willing to pay up to \$305,000 per year for this license and this is the maximum that the city could charge.