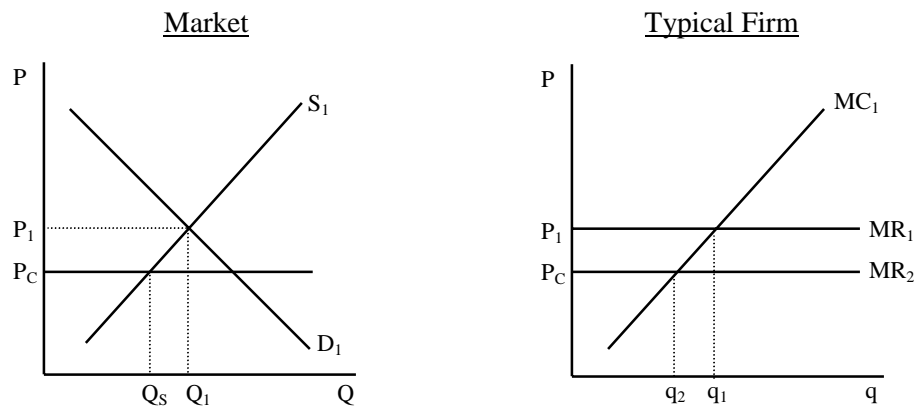


ECONOMICS 2

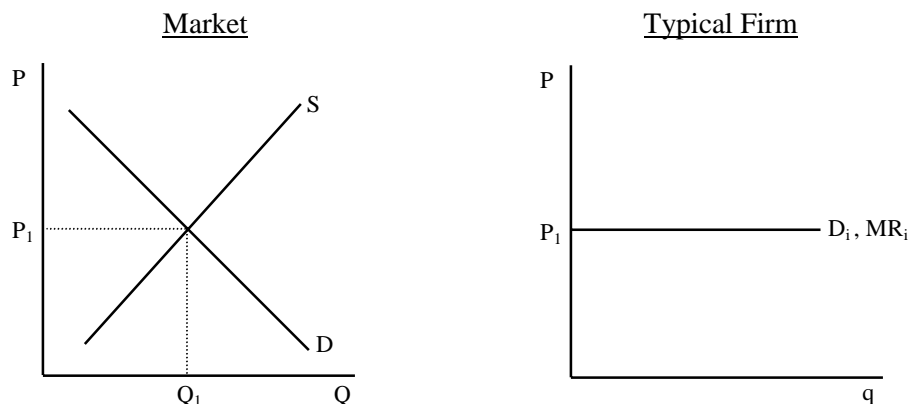
SUGGESTED ANSWERS TO MIDTERM 1

1. True. The easiest way to see the effects of a binding price ceiling is to consider the supply and demand diagram for the market. Before the price ceiling, the market supply curve was S_1 and the market demand curve was D_1 . The equilibrium price and quantity in this market were P_1 and Q_1 , respectively. The fact that the price ceiling is “binding” means that the controlled price (P_C) is set below the market equilibrium price. The market supply curve shows how much firms in the market want to supply at each price. If the price is reduced by law from P_1 to P_C , the quantity supplied will fall from Q_1 to Q_S .

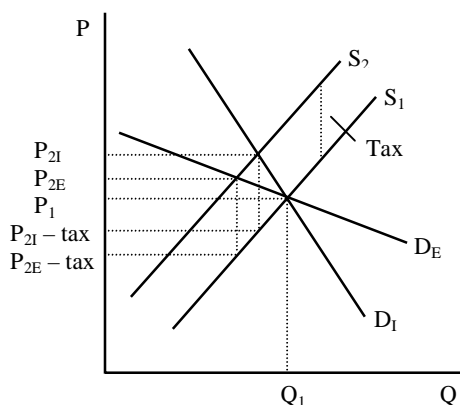


If one wanted to go into more depth (but this was not necessary to get full credit), one could include the diagram for a typical firm. Before the price ceiling, the profit-maximizing level of output for a typical firm was q_1 (the quantity where the initial marginal revenue curve (MR_1) intersects the initial marginal cost curve (MC_1)). The price ceiling creates a new marginal revenue curve (MR_2) by government edict; the typical competitive firm can now sell all that it wants at the lower controlled price. A typical firm chooses to produce where MR_2 intersects MC_1 , which occurs at q_2 . The quantity that each existing firm wants to supply is lower as the result of the price ceiling, which is consistent with the fact that the market quantity falls to Q_S .

2. False. A market demand curve (D in the diagram below) is always downward sloping because it reflects utility maximization on the part of households. However, the demand curve facing a typical competitive firm (D_i) is perfectly elastic; it is horizontal at the going market price. This comes from the definition of a competitive firm: each one is so small that it can sell as much as it wants at the going market price. This description of the demand curve facing a competitive firm implies that the marginal revenue it receives at each level of production is constant and equal to the going market price. Therefore, the marginal revenue curve for a competitive firm (MR_i) is flat, not downward sloping.



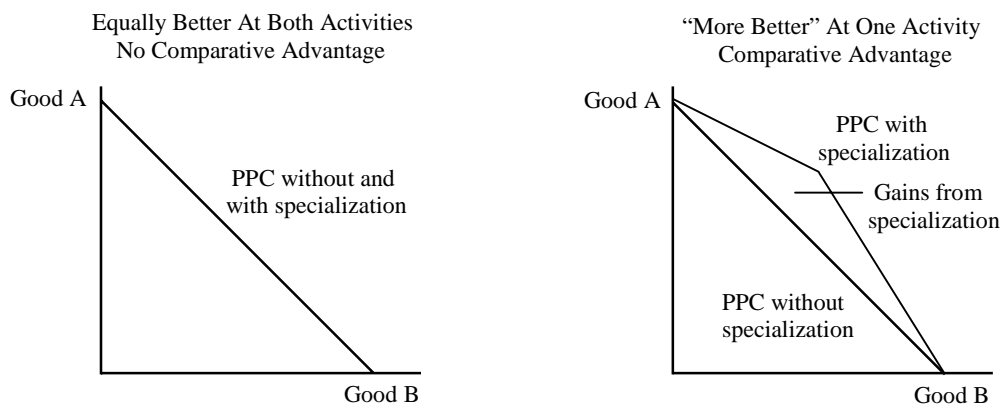
3. False. Both the price elasticity of demand and the price elasticity of supply affect the distribution of the tax burden. To focus in on the effect of the price elasticity of demand, consider two demand curves intersecting the same supply curve (S_1). Around a given point, the flatter demand curve (D_E) is more elastic than the steeper demand curve (D_I). Now, impose the tax. Since it is physically paid by the seller, the tax will increase marginal cost at every level. Thus, it will shift up the supply curve by the amount of the tax (from S_1 to S_2). The intersection of the two demand curves and the new supply curve shows the new equilibrium price paid by consumers for the two cases (P_{2I} and P_{2E}). The more elastic demand is, the less the price paid by consumers rises (and the more quantity falls). The after-tax price received by sellers is the new equilibrium price minus the tax. The less price rises for consumers, the more the after-tax price falls for producers. Therefore, the share of the tax paid by consumers will be smaller, not larger, the more elastic demand is.



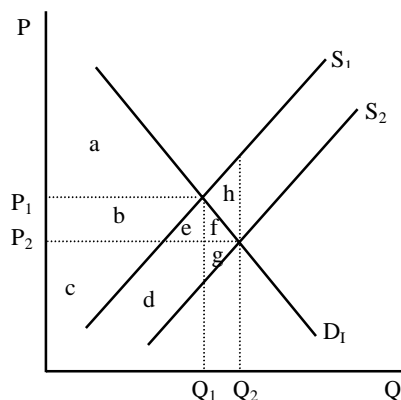
4. Uncertain. Two workers producing two goods may be able to produce better combinations of the two goods if they specialize, even if one worker has an absolute advantage in the production of both goods. Having an absolute advantage in the production of both goods just means that this one worker can produce more of each good in a given time period than the other worker. What matters for the gains from specialization is whether the opportunity cost of producing a good differs across the two workers. We say that a worker has a comparative advantage in the production of some good if he or she has a lower opportunity cost in producing that good than the other worker. If the more productive worker is equally better at the two activities, then the opportunity cost of the two workers in producing some good will be the same. In this case, there will be no gains from specialization. But, as long as the more productive worker is "more better" at one activity than the other, there will be a difference in opportunity cost and hence gains from specialization.

This is one question that can be answered well with just words. If one wanted to illustrate it, the appropriate diagram would be a two-good, two-person production possibilities curve (PPC) diagram. Absence of specialization implies that the two workers divide their time in the same way. This yields a PPC whose slope is constant and equal to the opportunity cost of the two workers combined of producing the good on the horizontal axis. If the more productive worker is equally better at the two activities, the two workers' individual opportunity costs are the same (and hence equal to their combined opportunity cost). Therefore, the slope of the PPC with specialization would also be constant and equal to the opportunity cost of the two workers combined. There would be no gains from specialization.

If the more productive worker is not equally better at the two activities, opportunity cost will differ across the two workers. Assuming the workers organize production along the lines of comparative advantage, the slope of the PPC with specialization will be flatter than the opportunity cost of the two workers combined at lower levels of production, but switch to higher than the combined opportunity cost at some level. The area between the PPC without and with specialization shows the gains from specialization.



5.a. The sugar market is defined as competitive and well functioning. This means that we can draw the usual supply and demand diagram and do not need to draw a distinction between the total (private) surplus and the total social surplus, as we would if there were some mention of an externality. Before the subsidy, the supply curve is S_1 and the demand curve is D_1 . The market equilibrium price is P_1 and the equilibrium quantity is Q_1 . The subsidy reduces the marginal cost of producers by 10 cents on each pound of sugar. Therefore, it shifts the supply curve down by the amount of the tax (to S_2). The new equilibrium price is P_2 and the new equilibrium quantity is Q_2 .



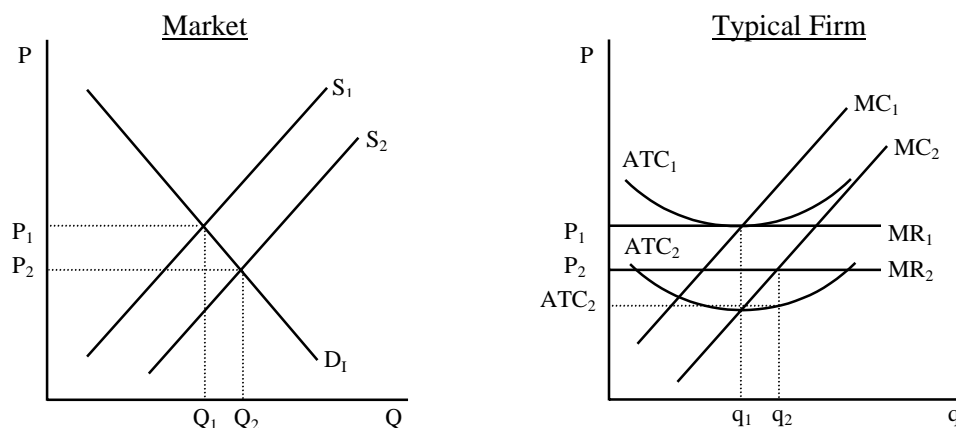
	Without the Subsidy (At Q_1)	With the Subsidy (At Q_2)
Consumer Surplus	a	a+b+e+f
Producer Surplus	b+c	c+d+g
-Government Expenditure		-(d+e+f+g+h)
Total Surplus	a+b+c	a+b+c-h
Deadweight Loss		h

The welfare accounting is straightforward. Before the subsidy, the consumer surplus is the area below D_1 and above P_1 (area a). Producer surplus is the area under P_1 and above S_1 (b+c). There are no government expenditures before the subsidy, so the total surplus is a+b+c. After the subsidy, the consumer surplus is the area under D_1 and above P_2 (a+b+e+f). Producer surplus is the area under P_2 and above S_2 (c+d+g). Government expenditure, which enters the calculation of total surplus negatively, is the area between S_1 and S_2 , up to Q_2 (d+e+f+g+h). The total surplus after the subsidy is a+b+c-h. There is indeed a deadweight loss associated with the subsidy (area h). This area represents the amount the government pays that is not reflected in larger producer or consumer surplus.

We knew that the subsidy had to cause a deadweight loss. In a well functioning competitive market, the total surplus is as large as possible at the market equilibrium quantity. Because the subsidy distorts behavior away from the market equilibrium, it has to decrease welfare.

b. To understand what happens in a competitive market in the long run, we need to look at the effect of the subsidy on the profits of a typical firm. Therefore, we need to draw the diagram for the market and for a typical firm. Since the market began in long-run equilibrium, we know that the initial marginal cost curve (MC_1) intersects both the initial marginal revenue curve (MR_1) and the average total cost curve (ATC_1) at the same point. The initial profit-maximizing level of output is q_1 .

The subsidy reduces the marginal cost for a typical firm by 10 cents at every level of production. Therefore, it shifts down both the marginal cost curve for a typical firm and the market supply curve by the same amount (to MC_2 and S_2 , respectively). It also reduces average total cost by 10 cents at each level, so ATC_1 also shifts down by the same amount (to ATC_2). The shift down in the market supply curve reduces the equilibrium price (to P_2). Notice, however, that the subsidy does not reduce the market price by the full amount of the subsidy in the short run; some of the effect of the subsidy shows up in an increase in the equilibrium market quantity (it increases to Q_2). Because the price does not fall by the full amount of the subsidy, MR_2 intersects MC_2 at a higher level of production (q_2) for the typical firm. At q_2 , price (P_2) is greater than average total cost (ATC_2). As a result, the typical firm is earning positive economic profits. We would therefore expect to see entry as a result of the subsidy.

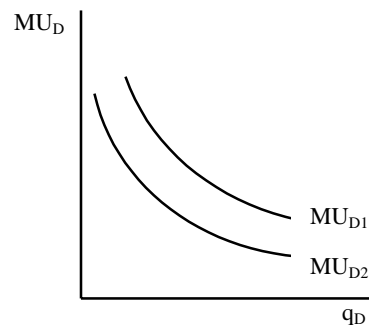


6.a. Bad news about a product will reduce the amount consumers demand at each price. That is, it will shift back the market demand curve. To see how this comes about in a utility-maximization framework, consider a typical consumer who had been choosing quantities of the drug and everything else such that:

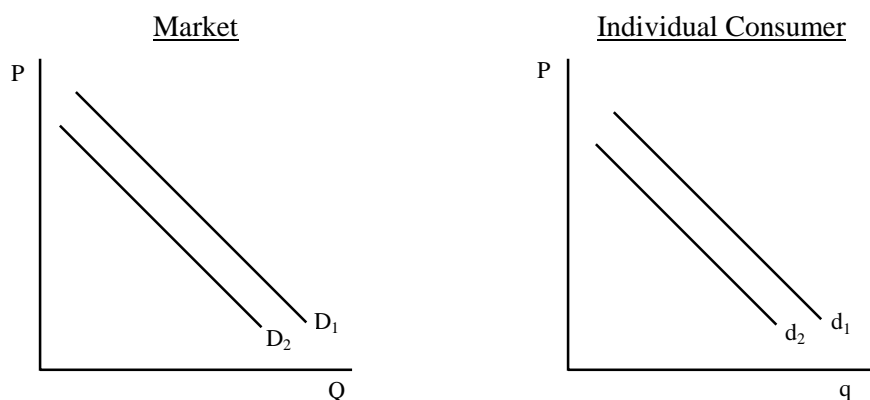
$$\frac{MU_D}{P_D} = \frac{MU_E}{P_E},$$

where the D subscript is for the drug, and E is for everything else.

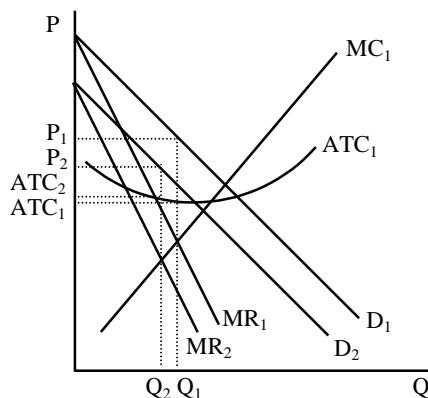
The bad news about the drug will reduce the marginal utility the consumer gets from the drug at each level of consumption. The marginal utility curve will shift down (from MU_{D1} to MU_{D2}). This change will cause the optimization condition to no longer hold at the initial quantities of the drug and everything else that the consumer was choosing. The MU_D/P_D will be less than MU_E/P_E . To return it to equality, the consumer needs to substitute away from the drug and toward everything else. Consuming less of the drug will increase the MU_D (the consumer will move up the new marginal utility curve (MU_{D2})). Consuming more of everything else will decrease the marginal utility of everything else (the consumer moves down the marginal utility curve for everything else).



So, at the same price for the drug, a typical consumer wants to consume less of it. The individual consumer's demand curve has shifted left (from d_1 to d_2). The market demand curve is the sum of the individual demand curves. Therefore, it too shifts left (from D_1 to D_2).



b. First, it is crucial to realize that since the firm holds a patent and is the only supplier of the drug, it is a monopolist. Therefore, it faces the downward-sloping market demand curve and its marginal revenue curve is also downward sloping and steeper than the demand curve. Before the change in tastes, the monopolist chooses to produce where its initial marginal revenue curve (MR_1) intersects its marginal cost curve (MC_1). This occurs at quantity Q_1 . The monopolist charges the price on the demand curve corresponding to Q_1 , which is P_1 . I have drawn in the average total cost curve (ATC_1) such that the monopolist was earning positive economic profits before the news.



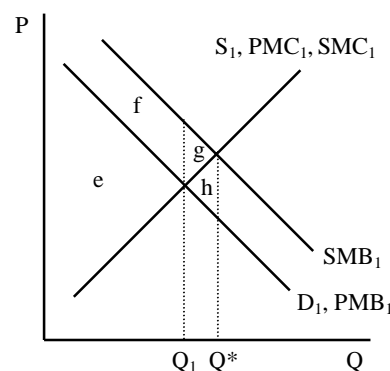
The change in tastes, as we showed in part (a), will cause the demand curve facing the monopolist to shift back (from D_1 to D_2). The marginal revenue curve, which is derived from the demand curve, will shift back as well (to MR_2). Assuming that the demand curve shifts back parallel to the original demand curve, the new marginal revenue curve will intersect the original marginal cost curve to the left of Q_1 . The new quantity the monopolist chooses to produce (Q_2) is less than the initial quantity.

In the diagram, it is clear that profits will decline as the result of the news. Profits before the change were the rectangle $(P_1 - ATC_1) \cdot Q_1$. After the change, they are $(P_2 - ATC_2) \cdot Q_2$. Since P_2 is lower than P_1 , ATC_2 is higher than ATC_1 , and Q_2 is lower than Q_1 , profits are lower. Because the diagram can get messy and inaccuracies can creep in, especially if one changes the slope as well as shifts the demand curve, it is useful to point out that there is a logical argument that profits must decline. Before the decrease in demand, the monopoly had the option of producing Q_2 . The fact that it did not choose to do this says that it had lower profits at Q_2 than at Q_1 . The decline in demand will only accentuate this difference.

MULTIPLE CHOICE

7. Consider the budget constraint for a consumer choosing between books and pizza. If books are on the vertical axis and pizza is on the horizontal axis, the slope of the budget constraint is:
- minus the price of books divided by the price of pizza.
 - flatter at low levels of pizza consumption and steeper at higher levels.
 - minus the price of pizza divided by the price of books.**
 - the same as the slope of the utility function.
 - none of the above.

8. Suppose there is a positive externality associated with a good. In the supply and demand diagram for this market shown to the right, the deadweight loss associated with producing at the market equilibrium is:



- g.**
 - g+h.
 - h.
 - e.
 - none of the above.
9. The PPC for a typical economy is bowed out because:
- as people consume more of a good, their marginal utility falls.
 - total surplus in a market is maximized at the level of production where supply equals demand.
 - in order to produce more and more of a good, we have to use workers whose opportunity cost is higher and higher.**
 - at low levels of production of a good, it is likely to be produced by a monopolist, but at higher levels it is likely to be produced by competitive firms.
10. If demand for a good is elastic, a decrease in the price (caused by an increase in supply) will:
- increase the total amount that consumers spend on the good.**
 - decrease the total amount consumers spend on the good.
 - either increase or decrease the total amount that consumers spend on the good depending on the level of marginal utility associated with the good.
11. Marginal revenue for a monopolist:
- is independent of demand.
 - is equal to the market price.
 - declines more rapidly than the price as the quantity sold increases.**
 - depends on marginal cost.

12. A binding price ceiling will cause:
- a deadweight loss.
 - a misallocation of production among producers.
 - a misallocation of consumption among consumers.
 - a and b.
 - a and c.**
 - a, b, and c.
13. The study by Esther Duflo in the supplemental reader found that an increase in pension payments in South Africa led to:
- reduced poverty among the elderly.
 - better education for all children living with someone receiving a pension.
 - remarkably little change in life expectancy among the elderly.
 - improved nutrition for girls living with a woman receiving a pension.**
 - a and b.
 - b and d.
 - c and d.
14. A perfectly competitive firm maximizes profits by producing where:
- total revenue equals total cost.
 - marginal revenue exceeds marginal cost.
 - price equals marginal cost.**
 - marginal benefit exceeds marginal cost.
15. A firm that is earning zero economic profits:
- will eventually want to leave the industry.
 - has total revenue less than total costs.
 - will want to shut down in the short run.
 - is covering the opportunity cost of all its inputs.**
16. Suppose there are two workers, Robinson and Friday, and two goods, fish and coconuts. If Robinson has a comparative advantage in catching fish:
- Friday must have a comparative advantage in gathering coconuts.**
 - Robinson can catch more fish in an hour than [Friday] can.
 - Robinson should spend all of his time catching fish and Friday should spend all of his time gathering coconuts.
 - The number of fish that Robinson can catch in an hour is greater than the number of coconuts he can gather in an hour.