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ECON 102 Wooten – Exam 1 – Practice Exam Solutions

1. D – When unlimited wants exceed limited resources
2. B – Factors of production
3. B – Channeling the payoffs for achieving success for different components of the course. This is why exams are generally worth a large percentage of a student's grade than homework assignments.
4. D – The maximum attainable combinations of two goods that can be produced with the available resources.
5. A – A point inside the PPF represents the underutilization of resources.
6. D – The negative slope of the boundary tells us that if we want more of Good A, we will need to give up units of Good B.
7. C – The unattainable points outside of the boundary because that level of production is not possible due to limited resources.
8. A – Resources are specialized so there is an increasing opportunity cost as we produce more and more of the same good.
9. D – The pizza oven is a capital good. Capital goods are used to produce consumer goods, like pizza.
10. E – Both B and C
11. E – Income flows to firms through produce markets
12. C – Firms and households

13. C – It shows how higher tax rates after a certain point of production produce progressively smaller amounts of revenue for the government.
14. C – There will be a \$1 difference between the price buyers pay and the price sellers receive. This \$1 difference is referred to as the “tax wedge.”
15. B – Mexico has an absolute advantage in producing one ton of corn. You have an absolute advantage when you have the lowest resource cost for producing a good, or you can produce more of a good with the same amount of resources.
16. E – Neither because both states have the same opportunity cost of producing oranges. Florida has an absolute advantage in producing both oranges and limes; however, we need to solve for opportunity cost of producing oranges to determine comparative advantage.
- Florida OC 1 orange = $-10 \text{ limes} / +10 \text{ oranges} = 1 \text{ lime}$
Georgia OC 1 orange = $-6 \text{ limes} / +6 \text{ oranges} = 1 \text{ lime}$
- Both Florida and Georgia need to give up 1 lime to gain 1 orange. Thus, they both have the same opportunity cost of producing oranges.
17. A – No, because neither has a comparative advantage in producing either good.
18. C – Through the use of positive analysis instead of normative analysis because positive analysis uses statements of facts.
19. B – Resources are limited and wants are unlimited.
20. A – Any point on or below the PPC is attainable and any point on the PPC is efficient.
21. A – Josh gives up 6 mangos to go from point A to point B.
22. C – Josh gives up 10 bananas to go from point B to point A. Make sure you pay close attention to which way you are moving along the PPC in these problems.
23. B – Josh can pick 56 bananas, Sarah can pick 32 bananas

Josh = 7 bananas an hour x 8 hours = 56 bananas
Sarah = 4 bananas an hour x 8 hours = 32 bananas

24. A – You know the PPC is linear because the opportunity cost is constant as Josh or Sarah pick more of one fruit and less of the other. If the opportunity cost of picking bananas increases as they pick more bananas or vice versa, then the PPC would be bowed.
25. B – Josh can pick 7 bananas an hour or 4 mangos an hour, and he has 8 hours a day to pick them. It will take Josh 5 hours to pick 35 bananas ($35 \text{ bananas} / 7 \text{ bananas an hour} = 5 \text{ hours}$). This means that Josh has 3 hours left to pick mangos. He can pick 4 mangos an hour, so he should be able to pick 12 mangos in 3 hours ($3 \text{ hours} \times 4 \text{ mangos an hour} = 12 \text{ mangos}$). The problem says that he is only picking 10 mangos each day. This point is attainable for Josh; however, it is inefficient because he could pick more mangos or bananas in an 8-hour day than he currently is.
26. C – Sarah can pick 4 bananas an hour or 7 mangos an hour, and she has 8 hours a day to pick them. The problem says that Sarah wants to pick 35 bananas and 10 mangos a day. Immediately you can see that this is an unattainable point for Sarah because she cannot pick 35 bananas in a day even if she spends 8 hours a day picking bananas. If Sarah spent 8 hours a day picking bananas, she would only be able to pick 32 bananas in a day ($4 \text{ bananas an hour} \times 8 \text{ hours} = 32 \text{ bananas}$). Certainly she wouldn't be able to pick 35 bananas a day and 10 mangos.
27. A – Josh should specialize in bananas and Sarah should specialize in mangos. Josh can pick 56 bananas a day ($7 \text{ bananas an hour} \times 8 \text{ hours} = 56 \text{ bananas}$) and Sarah can pick 56 mangos a day ($7 \text{ mangos an hour} \times 8 \text{ hours} = 56 \text{ mangos}$). Josh will give Sarah half of his bananas and Sarah will give Josh half of her mangos. This means they will each get 28 bananas and 28 mangos.
28. D – They allow individuals to consume more than they would be able to on their own.
29. D – Market economies let the free market set price.
30. C – They are self-organizing because they don't require government oversight
31. B – Being able to see Phish for less than \$60 is a good deal.
32. B – This statement cannot be verified as true or false because it is an opinion.
33. B – There is an inverse relationship between price and quantity demanded.

34. A – That all other factors are held constant.
35. B – A shortage means that demand is greater than supply. Suppliers will raise price until supply and demand are equal.
36. A – Demand curves have a negative coefficient on P, and supply curves have a positive coefficient on P.
37. D – Set the equations equal to find the equilibrium price. Then plug the equilibrium price back into the supply and demand equations to find the equilibrium quantity.

$$25 - 7P = P + 9$$

$$16 = 8P$$

$$P = 2$$

$$Q_d = 25 - 7(2) = 11$$

$$Q_s = (2) + 9 = 11$$

38. A – Plug the price of \$3 into the supply and demand equations to find the quantity demanded and quantity supplied at this price. You find that the quantity supplied exceeds the quantity demanded by 8 units. When the quantity supplied is greater than the quantity demanded, there will be excess supply, which is referred to as a surplus.

$$Q_d = 25 - 7(3) = 4$$

$$Q_s = 3 + 9 = 12$$

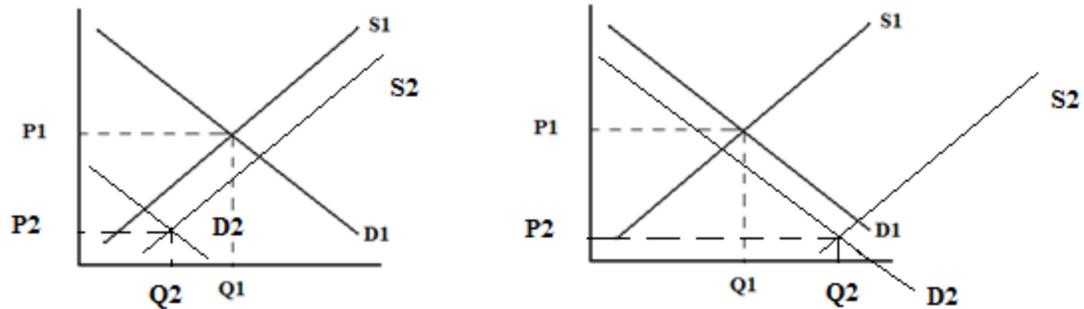
39. C – Plug the price of \$1 into the supply and demand equations to find the quantity demanded and the quantity supplied at this price. You find that the quantity demanded exceeds the quantity supplied by 8 units. When the quantity demanded exceeds the quantity supplied, there will be excess demand, which is referred to as a shortage.

$$Q_d = 25 - 7(1) = 18$$

$$Q_s = 1 + 9 = 10$$

40. A – The fire that wiped the crops would be considered a natural disaster. This would shift the supply curve inward to the left.
41. C – The price of a substitute decreasing will shift demand for Sierra Nevada inward to the left. The improvement in technology will shift Sierra Nevada's supply curve outward to the right.

42. D – Remember to draw two graphs side by side for these problems, as we did in the exam review. You can see that in both graphs the equilibrium price decreases, but we cannot determine the effect on equilibrium quantity.



43. B – If hot dogs become more expensive, people are going to buy fewer hot dog buns because they are complementary goods.
44. C – This is the point where supply and demand intersect.
45. C – At a price of \$4, the quantity supplied will be 800 units and the quantity demanded will be 400 units. This means supply will exceed demand by 400 units ($800 - 400 = 400$).
46. A – At a price of \$1 the quantity supplied will be 200 units and the quantity demanded will be 1,000 units. This means that demand will exceed supply by 800 units ($1,000 - 200 = 800$). When demand exceeds supply, it is called a shortage.
47. B – Market failure prevents economic efficiency.
48. C – Positive 0.75. You know the goods are substitutes because the cross price elasticity is positive.

$$E_{xy} = \frac{\% \Delta Qd \text{ for good } x}{\% \Delta P \text{ for good } y} = \frac{30\%}{40\%} = 0.75$$

49. B – Demand is inelastic when there are no substitutes available.
50. A – Demand becomes more elastic as time passes.
51. A – Inelastic because we are generally not sensitive to changes in prices of goods that make up a small percent of our income.

52. B – The cost of someone’s rent or mortgage is typically a large percent of their overall income so people will be sensitive to changes in the cost of housing.

53. D – 5

$$E_p = \frac{Qd2 - Qd1}{(Qd1 + Qd2)/2} \div \frac{P2 - P1}{(P1 + P2)/2}$$

$$E_p = \frac{0 - 10}{(10 + 0)/2} \div \frac{6 - 4}{(4 + 6)/2} = -5$$

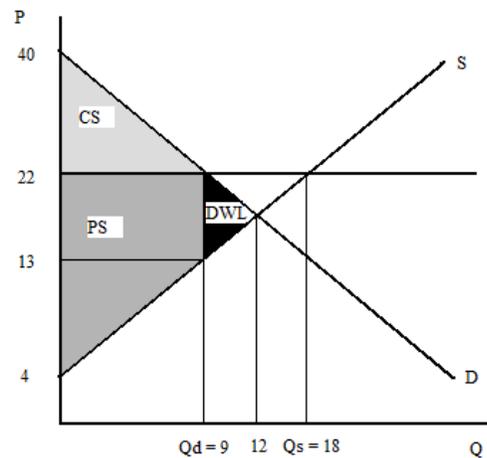
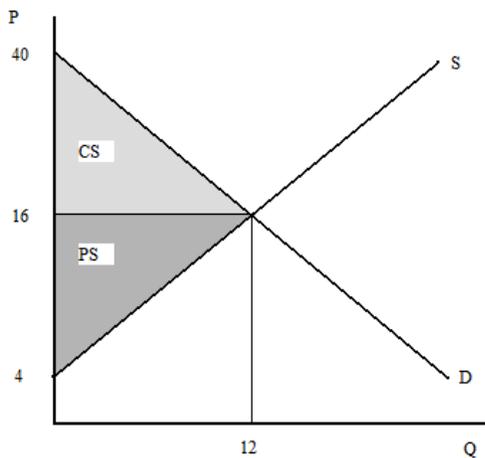
$$|E_p| = 5$$

54. B – Perfectly elastic would be completely horizontal

55. D – Perfectly inelastic would be completely vertical

56. A – They are substitutes because goods are substitutes when cross-price elasticity is positive.

Use the graphs below for the next 6 problems



57. D – P = 16, Q = 12

$$4 + Q = 40 - 2Q$$

$$3Q = 36$$

$$Q = 12$$

$$P = 4 + 12 = 16$$

$$P = 40 - 2(12) = 16$$

58. C – CS = 144, PS = 72

$$CS = (1/2)(12)(40 - 16) = 144$$

$$PS = (1/2)(12)(16 - 4) = 72$$

59. A – CS = 81, PS = 121.5

Quantity demanded at a price of \$22

$$P = 40 - 2Q_d$$

$$\$22 = 40 - 2Q_d$$

$$Q_d = 9$$

Price suppliers would be willing accept at a quantity of 9 units

$$P = 4 + Q_s$$

$$P = 4 + 9$$

$$p = 13$$

$$CS = (1/2)(9)(40 - 22) = 81$$

$$PS = (1/2)(9)(13-4) + (9)(22 - 13) = 121.5$$

60. A – DWL = 13.5

$$DWL = (1/2)(22 - 13)(12 - 9) = 13.5$$

61. C – CS Decreased, PS increased

62. B – Excess supply of 9

Quantity demanded at a price of \$22:

$$P = 40 - 2Q_d$$

$$\$22 = 40 - 2Q_d$$

$$Q_d = 9$$

Quantity supplied at a price of \$22:

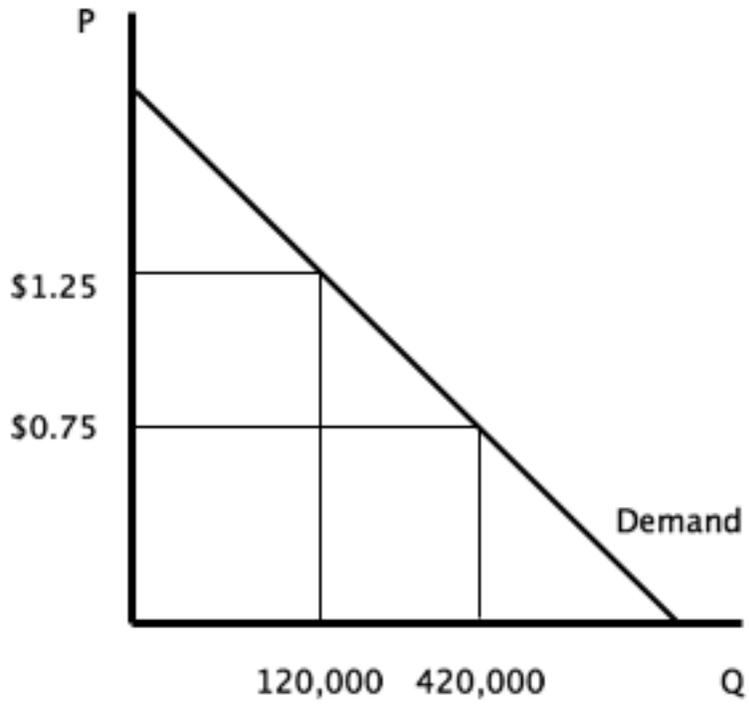
$$P = 4 + Q_s$$

$$\$22 = 4 + Q_s$$

$$Q_s = 18$$

Short Answer Problems

1.



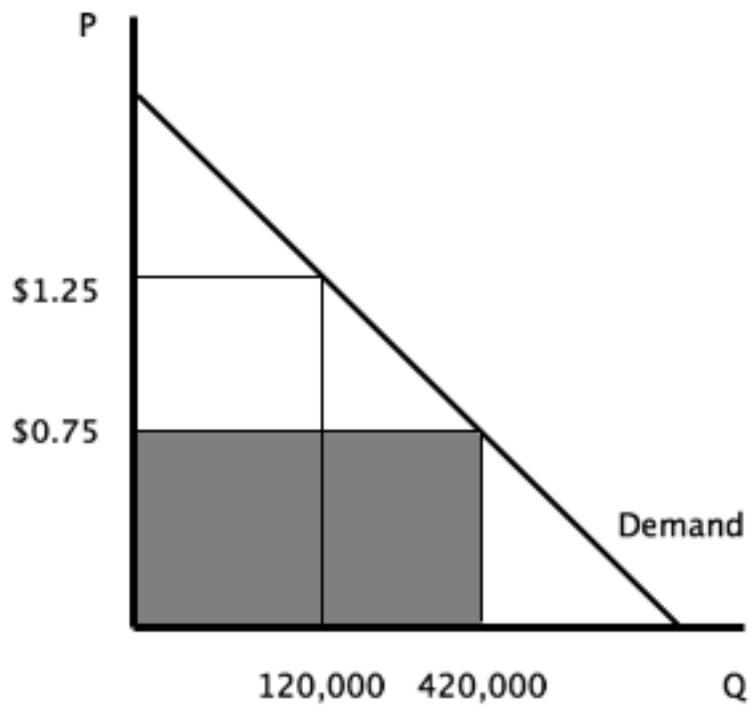
2. \$315,000

Total Revenue = Price x Quantity

Total Revenue = \$0.75 x 420,000

Total Revenue = \$315,000

We can also illustrate this area on the graph by shading in a rectangle using the points \$0.75 and 420,000 units.



3. 11%

March = 108 minutes

April = 120 minutes

$$\text{Percentage change} = \frac{\text{New} - \text{Old}}{\text{Old}}$$

$$\text{Percentage change} = \frac{120 - 108}{108} = 0.11 = 11\%$$

4. 230 burritos

In this problem, we know the “old” value and the “percentage change.” We can use these values to solve for the “new” value below.

$$\text{Percentage change} = \frac{\text{New} - \text{Old}}{\text{Old}}$$

$$0.034 = \frac{\text{New} - 222}{222}$$

$$7.548 = \text{New} - 222$$

$$\text{New} = 229.54$$

5. \$250,000. Opportunity cost is the value of your next best alternative. Mike’s next best alternative is playing in China earning a salary of \$250,000.

6. 0.33 washed pool decks

OC of cleaning pools = Loss in washed decks / Gain in cleaned pools

OC of cleaning pools = 2 / 6 = 0.33 washed pool decks

7. The first step is to determine which country has a comparative advantage in coal, and which country has a comparative advantage in silver. Comparative advantage is determined by finding which country has the lowest opportunity cost for producing that good.

$$\text{China OC Coal} = 16 / 96 = 0.167 \text{ silver}$$

$$\text{China OC Silver} = 96 / 16 = 6 \text{ coal}$$

$$\text{India OC coal} = 48 / 48 = 1 \text{ silver}$$

$$\text{India OC silver} = 48 / 48 = 1 \text{ coal}$$

China has the comparative advantage in coal, and India has the comparative advantage in silver.

Production with trade

China = 0 silver, 96 coal

India = 48 silver, 0 coal

Consumption with trade

China = 24 silver, 48 coal

India = 24 silver, 48 coal

Gains from trade

China = 16 silver, 0 coal

India = 16 silver, 8 coal

	China		India	
	Silver	Coal	Silver	Coal
Consumption without trade	8	48	8	40
Production with trade	0	96	48	0
Consumption with trade	24	48	24	48
Gains from trade	16	0	16	8

8. California has a comparative advantage in pinot, and Oregon has a comparative advantage in marijuana.

CA OC pinot = $12 / 4 = 3$ pounds marijuana

CA OC marijuana = $4 / 12 = 0.33$ bottles pinot

OR OC pinot = $20 / 5 = 4$ pounds marijuana

OR OC marijuana = $5 / 20 = 0.25$ bottles pinot

CA should produce pinot, and OR should produce marijuana.

After the states specialize and trade, California gains by consuming the same amount of pinot and 2 additional pound(s) of marijuana. Oregon gains by consuming the same amount of pinot and 1 additional pound(s) of marijuana.

CA will produce 4 bottles of pinot. The problem says CA wants to keep its wine consumption the same so CA will only consume 1 bottle of pinot. CA can then trade the other 3 bottles for 11 pounds of marijuana. CA was previously consuming 9 pounds of marijuana so it will gain an additional 2 pounds ($11 - 9 = 2$) of marijuana.

OR will produce 20 pounds of marijuana. OR wants to keep its pinot consumption the same so it will need to trade 11 pounds of marijuana for 3 bottles of wine. This leaves OR with 9 pounds of marijuana ($20 - 11 = 9$). OR previously consumed 8 pounds of marijuana so it gains 1 pound of marijuana from the trade.

9. To find the equilibrium price and quantity, you need to set $Q_d = Q_s$.

$$400 - 10P = 100 + 20P$$

$$300 = 30P$$

$$P = 10$$

Now you can plug P back into either the Q_d or Q_s equation to find the equilibrium quantity. Since \$10 is the price that makes Q_d and Q_s equal, it doesn't matter which equation you plug \$10 back into. However, a good way to check that you got this problem correct is to plug the value you found for P back into both equations. If both equations give you the same Q , it is very likely you have the correct answer.

$$Q_d = 400 - 10(10) = 300$$

$$Q_s = 100 + 20(10) = 300$$

Will there be a shortage or a surplus if the price of this good is \$7? Will the price of the good rise or fall over time?

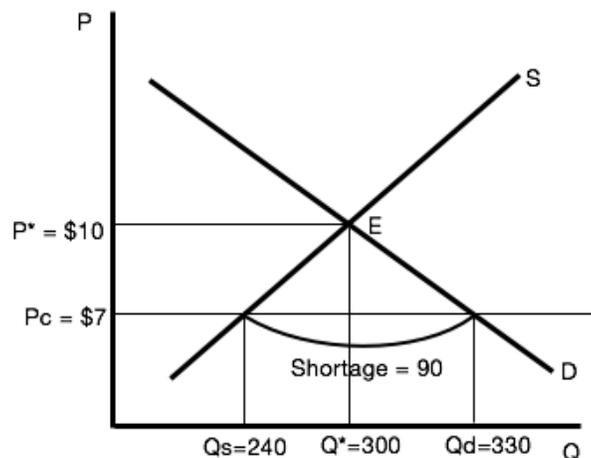
$$Q_d = 400 - 10(P)$$

$$Q_d = 400 - 10(7) = 330$$

$$Q_s = 100 + 20(P)$$

$$Q_s = 100 + 20(7) = 240$$

There is a shortage of 90 units ($330 - 240 = 90$) because Q_d is greater than Q_s . We expect the price of the good to rise over time.

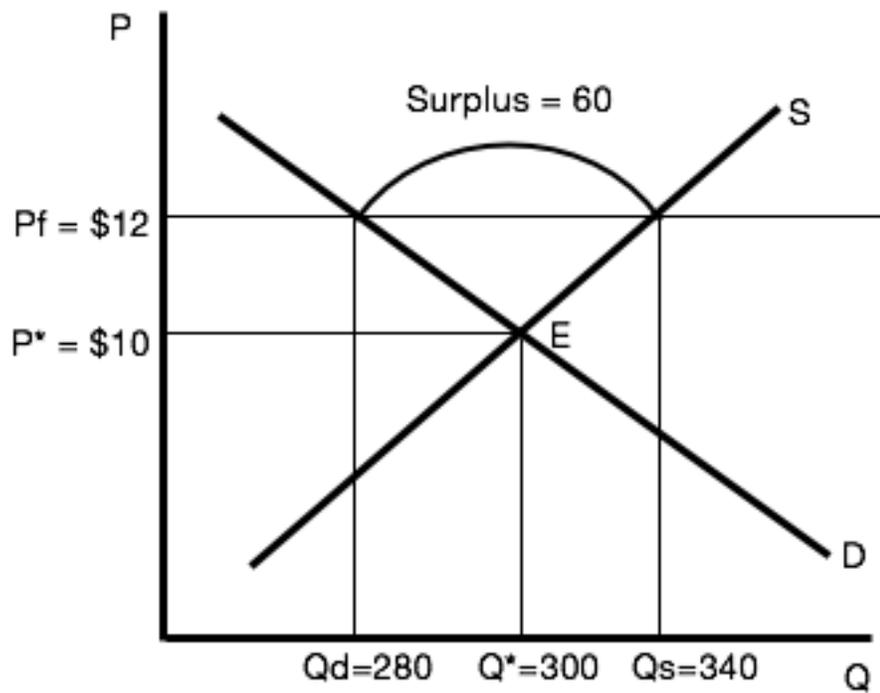


Will there be a shortage or a surplus if the price of this good is \$12? Will the price of the good rise or fall over time?

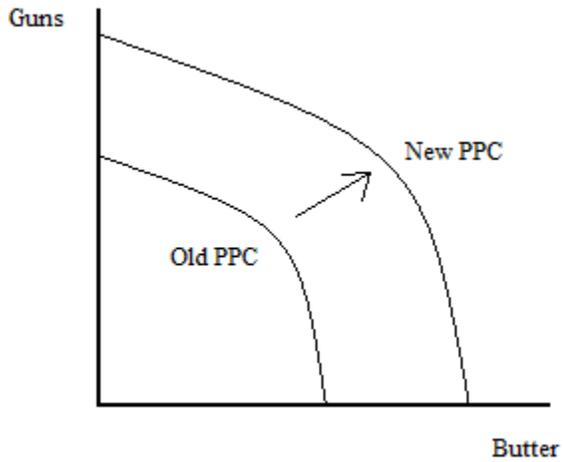
$$Q_d = 400 - 10(12) = 280$$

$$Q_s = 100 + 20(12) = 340$$

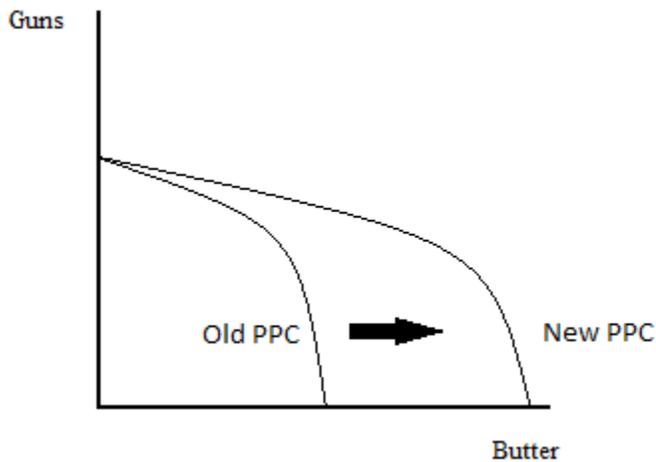
There is a surplus of 60 units ($340 - 280 = 60$) because Q_s is greater than Q_d . We expect the price of the good to fall over time.



10. The improvement in technology will cause the PPC to shift outward:



11. In this problem only the technology for producing butter is increasing. When this is the case you will keep the intercept for guns in the same place, but you will shift the intercept for butter outward.



12. Opportunity cost of moving from point C to D = 80 sticks of butter

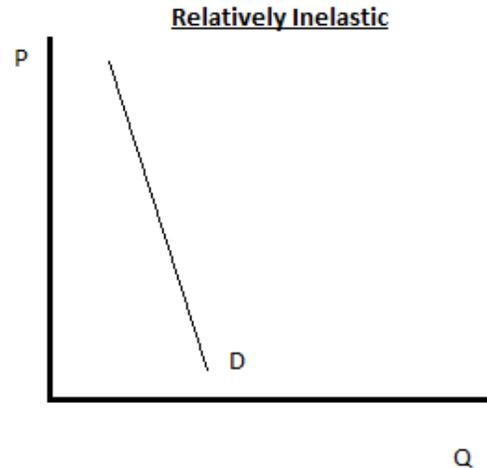
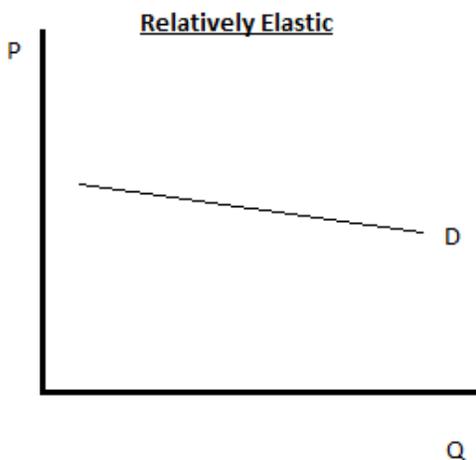
Make sure that you read this question carefully. We are moving from point C to point B. This means that we will need to give up 80 sticks of butter to produce 60 more guns. Since we are giving up 80 sticks of butter to move from point C to point B, the opportunity cost of the move is 80 sticks of butter.

Note that if the question had asked what the opportunity cost of moving from point B to point C was, the answer would have been 60 guns because you are giving up making 60 guns to move from B to C. It is important to pay attention to which way you are moving along the PPC.

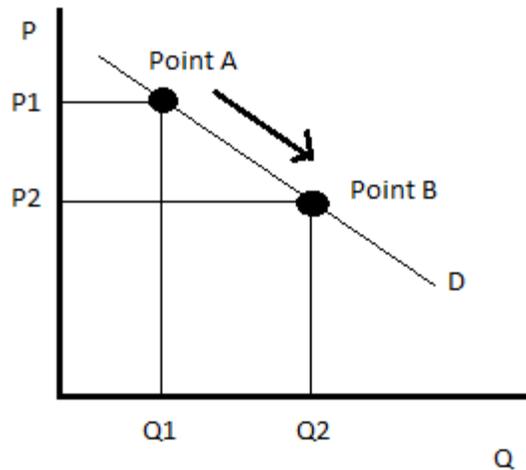
Inefficient point = Point E

Unattainable point = Point F

13. A relatively elastic demand curve will have a shallow slope because consumers are sensitive to changes in price. A relatively inelastic demand curve will have a steep slope because consumers are not sensitive to changes in price.



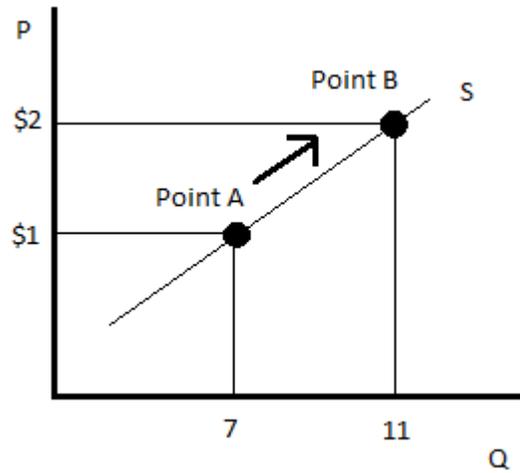
14. The demand curve is downward sloping with quantity on the horizontal axis and price on the vertical axis. A decrease in the good's own price will cause an **increase in quantity demand**. This is reflected by movement downward along the demand curve (not a shift of the demand curve). Make sure that you labeled your points clearly, showed which direction you were moving along the demand curve, and labeled the corresponding price and quantity points on the axes with the notation P1, P2, Q1, and Q2.



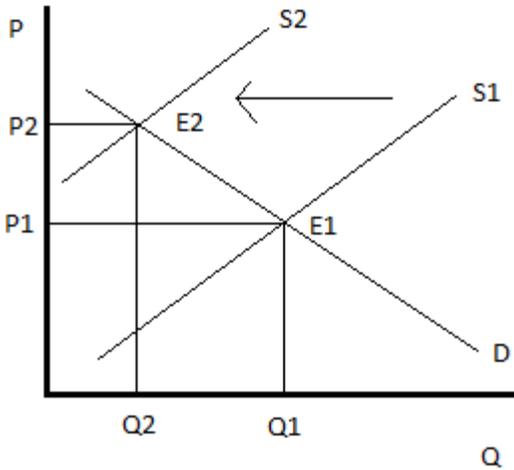
15. The supply curve is upward sloping with quantity on the horizontal axis and price on the vertical axis. An increase in the good's own price will cause an **increase in quantity supplied**. You can use the equation $Q_s = 3 + 4P$ to find the Q_s at a price of \$1 and \$2. Make sure you include an arrow showing which way we are moving along the curve.

$$Q_s = 3 + 4(\$1) = 7$$

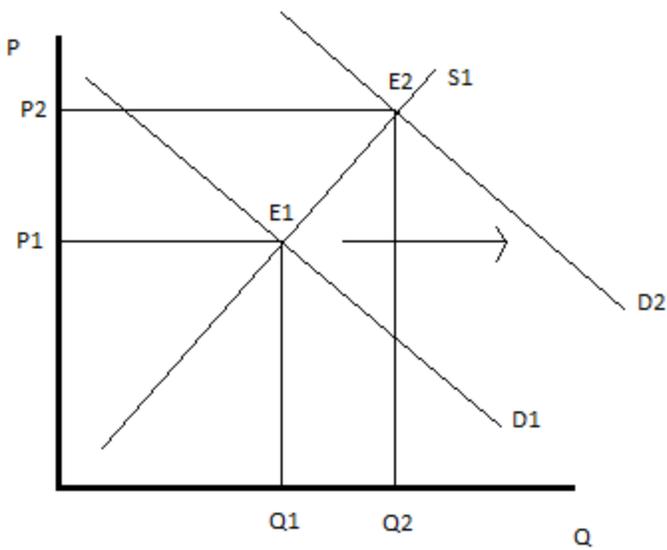
$$Q_s = 3 + 4(\$2) = 11$$



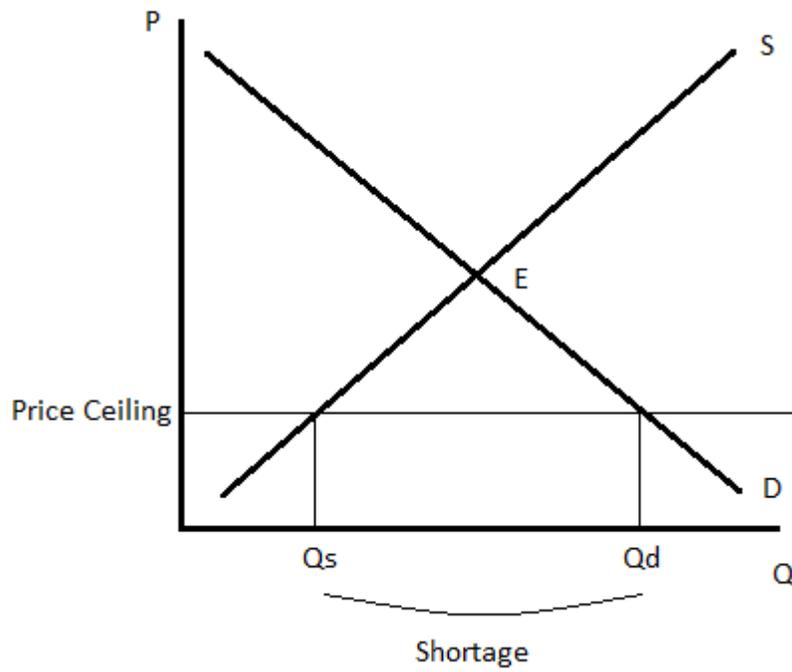
16. A change in the cost of inputs used to make a product will shift the supply curve inward to the left. Make sure to show the shift with an arrow pointing left (not up or down). Shifts of the supply and demand curves are always shown as right or left shifts.



17. An increase in the income level of the general population will cause the demand curve to shift outward to the right.



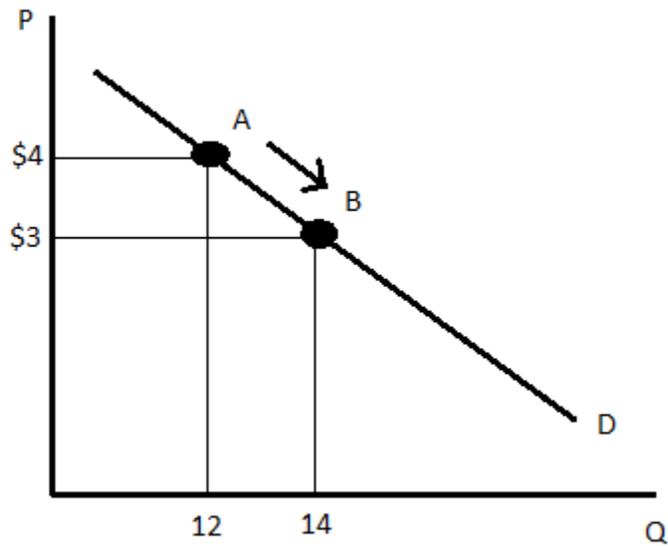
18. The price ceiling will result in a shortage because the quantity supplied will be less than the quantity demanded.



19. The demand curve is downward sloping with quantity on the horizontal axis and price on the vertical axis. A decrease in the good's own price will cause an **increase in quantity demanded**. You can use the equation $Q_d = 20 - 2P$ to find the Q_d at a price of \$4 and \$3. Make sure you include an arrow showing which way we are moving along the curve.

$$Q_d = 20 - 2(\$4) = 12$$

$$Q_d = 20 - 2(\$3) = 14$$



20. The first thing to do is solve for the equilibrium price and quantity for last year and then this year.

Last Year

$$Q_s = Q_d$$

$$6 + 2P = 90 - 2P$$

$$4P = 84$$

$$P = 21$$

$$Q_s = 6 + 2(21) = 48$$

$$Q_d = 90 - 2(21) = 48$$

$$P^* = 21, Q^* = 48$$

This Year

$$Q_s = Q_d$$

$$6 + 2P = 138 - 2P$$

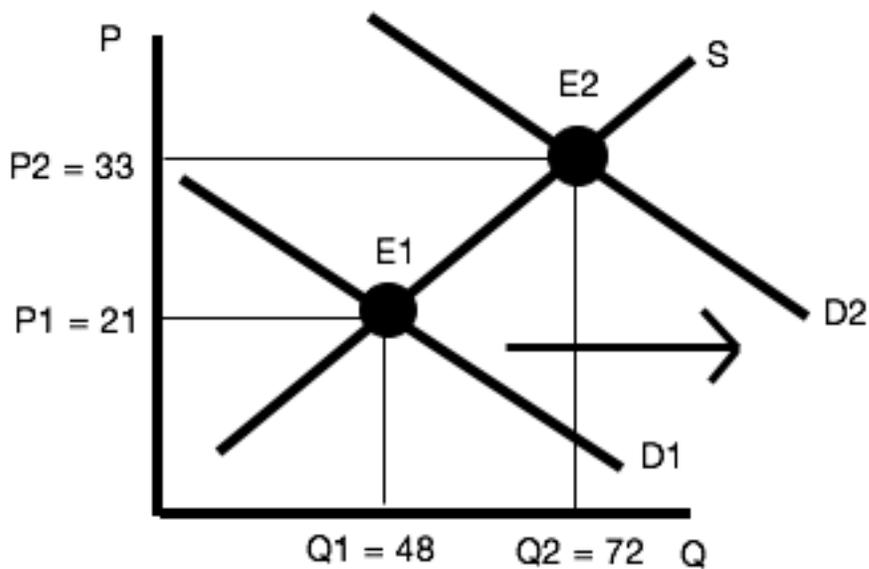
$$4P = 132$$

$$P = 33$$

$$Q_s = 6 + 2(33) = 72$$

$$Q_d = 138 - 2(33) = 72$$

$$P^* = 33, Q^* = 72$$



21. Reasons for rent control: Provides more affordable housing to lower income individuals, and it allows people to find affordable housing in the city so they don't have to commute.

Reasons against rent control: Black markets often appear, apartments are not well maintained, there is a severe shortage of units available, there is no incentive to build new units over time due to low prices.

22. 1.5 Elastic

$$E_P = \frac{60-100}{(100+60)/2} \div \frac{7-5}{(5+7)/2} = -1.5$$

$$|E_P| = 1.5$$

23. 0.15 Inelastic

$$E_P = \frac{190-200}{(190+200)/2} \div \frac{14-10}{(14+10)/2} = -0.15$$

$$|E_P| = 0.15$$

24. 1 Unit elastic

$$E_P = \frac{2,000-1,000}{(2,000+1,000)/2} \div \frac{25-50}{(25+50)/2} = -1$$

$$|E_P| = 1$$

25. 1/7, Inelastic

$$Q_{d1} = 15$$

$$Q_{d2} = 13$$

$$P_1 = \$1$$

$$P_2 = \$3$$

$$E_P = \frac{13-15}{(15+13)/2} \div \frac{\$3-\$1}{(\$1+\$3)/2}$$

$$E_P = \frac{-2}{14} \div \frac{\$2}{2}$$

$$E_P = \frac{-2}{14} = \frac{-1}{7}$$

$$|E_P| = \frac{1}{7}$$

The price elasticity of demand is inelastic because it is between 0 and 1.

26. 1, Unit Elastic

$$Q_{s1} = 2$$

$$Q_{s2} = 6$$

$$P_1 = \$1$$

$$P_2 = \$3$$

$$E_s = \frac{6-2}{(2+6)/2} \div \frac{\$3-\$1}{(\$1+\$3)/2}$$

$$E_s = \frac{4}{4} \div \frac{\$2}{2}$$

$$E_s = 1$$

The price elasticity of supply is unit elastic because it is equal to 1.

27. 9/23, Inelastic

$$Q_{d1} = 12$$

$$Q_{d2} = 11$$

$$P_1 = \$4$$

$$P_2 = \$5$$

$$E_P = \frac{11-12}{(12+11)/2} \div \frac{\$5-\$4}{(\$4+\$5)/2}$$

$$E_P = \frac{-1}{11.5} \div \frac{\$1}{4.5}$$

$$E_P = \frac{-4.5}{11.5} = \frac{-9}{23}$$

$$|E_P| = \frac{9}{23}$$

The price elasticity of demand is inelastic because it is between 0 and 1.

28. 1, Unit elastic

$$Q_{s1} = 8$$

$$Q_{s2} = 10$$

$$P_1 = \$4$$

$$P_2 = \$5$$

$$E_s = \frac{10-8}{(8+10)/2} \div \frac{\$5-\$4}{(\$4+\$5)/2}$$

$$E_s = \frac{2}{9} \div \frac{\$1}{4.5}$$

$$E_s = 1$$

The price elasticity of supply is unit elastic because it is equal to 1.

29. Tax amount = $\$45 - \$25 = \$20$

30. Incidence of tax the consumer bears = $(\$45 - \$30) / \$20 = 0.75 = 75\%$

31. Incidence of tax the producer bears = $(\$30 - \$25) / \$20 = 0.25 = 25\%$

32. Tax revenue = $(\$45 - \$25)(80) = \$1,600$

33. DWL = $(1/2)(\$45 - \$25)(100 - 80) = 200$

34. CS before tax = $(1/2)(100)(\$100 - \$30) = 3,500$

35. CS after tax = $(1/2)(80)(\$100 - \$45) = 2,200$

36. PS before tax = $(1/2)(100)(\$30) = 1,500$

37. PS after tax = $(1/2)(80)(\$25) = 1,000$

38. Surplus of 26 units

$$Q_d = 18 - 2(\$8) = 2$$

$$Q_s = 4 + 3(\$8) = 28$$

$$Q_s > Q_d = \text{Surplus of 26 units (28 units} - 2 \text{ units} = 26 \text{ units)}$$

39. Shortage of 19 units

$$Q_d = 55 - 4(\$5) = 35$$

$$Q_s = 11 + \$5 = 16$$

$$Q_d > Q_s = \text{Shortage of 19 units (35 units} - 16 \text{ units} = 19 \text{ units)}$$