Price Ceilings and Floors

1. A price ceiling is a:
   A. legally established minimum price that can be charged for a good.
   B. legally established maximum price that can be charged for a good.
   C. minimum price that is in fact charged in a competitive market.
   D. maximum price that is in fact charged in a competitive market.
   E. maximum price that the good has ever sold for.

2. A price floor is a:
   [same options as the previous question]

3. A price ceiling creates _____ when it is set _____ the equilibrium price.
   A. excess demand -- below
   B. excess demand -- above
   C. excess supply -- below
   D. excess supply -- above

4. A price floor creates _____ when it is set _____ the equilibrium price.
   [same options as the previous question]

5. A price ceiling usually results in ______ consumer surplus, ______ producer surplus, and ______
   A. higher - lower - some deadweight loss
   B. higher - lower - higher tax revenues
   C. lower - higher - some deadweight loss
   D. lower - higher - higher tax revenues
   E. lower - lower - some deadweight loss

6. A price floor usually results in ______ consumer surplus, ______ producer surplus, and ______
   [same options as the previous question]

7. The wholesale market equilibrium price is 6 cents a pound for raw sugar, and the market quantity sold is 30 million pounds. Which of the following policies would create an excess supply of sugar?
   A. A price ceiling of 10 cents a pound
   B. A price floor of 10 cents a pound
   C. A price ceiling of 3 cents a pound
   D. A price floor of 3 cents a pound.

8. The wholesale market equilibrium price is 6 cents a pound for raw sugar, and the market quantity sold is 30 million pounds. Which of the following policies would create an excess demand for sugar?
   [same options as the previous question]

9. If there is excess demand for a product because of price controls, we can be sure that the price control being used is a:
   A. price floor
   B. price ceiling
   C. excise tax on producers
   D. sales tax on consumers

10. If there is excess supply for a product because of price controls, we can be sure that the price control being used is a: [same options as the previous question]
The demand equation is $Q_d = 1000 - 2P$, and the supply equation is $Q_s = 3P$

11. The equilibrium price resulting from the above equations is (fill in the blank; show calculations below)

12. The equilibrium quantity resulting from the above equations is (fill in the blank; show calculations below)

13. If a price ceiling is set at $100, the quantity demanded will be (fill in the blank, show calculations below)

14. If a price ceiling is set at $100, the quantity supplied will be (fill in the blank, show calculations below)

15. As a result of the price ceiling, there will be:
   A. an excess demand for the good
   B. an excess supply of the good
   C. no change from equilibrium demand or supply, because the price ceiling is not binding.

16. Pareto optimality means that:
   A. no one can be made better off without making someone else worse off
   B. we have a better outcome than would be delivered by free markets with too much competition.
   C. everyone has an equal standard of living
   D. we have an ideal system of central planning.

17. Free markets will deliver Pareto optimal results:
   A. Even if consumers do not have full information about the product they are buying (as in medical services)
   B. Even if there are just a few sellers in the market for the good.
   C. Even if there are positive externalities.
   D. Even if there are negative externalities.
   E. Only if all of the above conditions do NOT hold.

18. Price controls will always deliver results which are closer to Pareto optimality than the market.
   A. True  B. False

19. The market will always deliver results which are closer to Pareto optimality than can be achieved by legislation.
   A. True  B. False
Consider the following graph of a price floor:

20. The area C + V + A represents:
   A. consumer surplus after the price floor.
   B. consumer surplus before the price floor.
   C. producer surplus after the price floor.
   D. producer surplus before the price floor.
   E. deadweight loss after the price floor.

21. The area C represents: [same options as the previous question]

22. The area W + M + P represents: [same options as the previous question]

23. The area A + M represents: [same options as the previous question]

24. The area I represents:
   A. The consumer share of deadweight loss.
   B. The producer share of deadweight loss.
   C. The producer surplus after the price floor.
   D. The total variable cost of production after the price floor.

25. The area V + W + P represents: [same options as the previous question]
The following calculation questions require for any credit a clear presentation of exactly what area you are calculating. Show your calculations clearly and neatly (use the back of the previous page if you need to do some preliminary work) below the question; use the blank before the question for your final answer

26. What is the numerical value of consumer surplus before the price floor?

27. What is the numerical value of consumer surplus after the price floor?

28. What is the numerical value of producer surplus before the price floor?

29. What is the numerical value of producer surplus after the price floor?

30. What is the numerical value of deadweight loss after the price floor?
ANSWERS

1. A price ceiling is a:
   B. legally established maximum price that can be charged for a good.

2. A price floor is a:
   A. legally established minimum price that can be charged for a good.
   [same options as the previous question]

3. A price ceiling creates _____ when it is set _____ the equilibrium price.
   A. excess demand -- below

4. A price floor creates _____ when it is set ______ the equilibrium price
   D. excess supply -- above

5. A price ceiling usually results in ______ consumer surplus, ______ producer surplus, and ______
   A. higher - lower - some deadweight loss

6. A price floor usually results in ______ consumer surplus, ______ producer surplus, and ______
   [same options as the previous question]
   C. lower - higher - some deadweight loss

7. The wholesale market equilibrium price is 6 cents a pound for raw sugar, and the market quantity sold is
   30 million pounds. Which of the following policies would create an excess supply of sugar?
   B. A price floor of 10 cents a pound

8. The wholesale market equilibrium price is 6 cents a pound for raw sugar, and the market quantity sold is
   30 million pounds. Which of the following policies would create an excess demand for sugar?
   C. A price ceiling of 3 cents a pound

9. If there is excess demand for a product because of price controls, we can be sure that the price control
   being used is a:
   B. price ceiling

10. If there is excess supply for a product because of price controls, we can be sure that the price control
    being used is a: [same options as the previous question]
    A. price floor
The demand equation is $Q_d = 1000 - 2P$, and the supply equation is $Q_s = 3P$

11. The equilibrium price resulting from the above equations is (fill in the blank; show calculations below)
   
   \[
   \text{Equilibrium condition: } \ Q_d = Q_s = Q^* \\
   \text{or } \ 1000 - 2P^* = 3P^* \\
   \text{adding 2P to each side: } \ 1000 = 5P^* \\
   \text{dividing by 5: } \ P^* = 200
   \]

12. The equilibrium quantity resulting from the above equations is (fill in the blank; show calculations below)
   
   \[
   \text{Substitute the } P^* = 200 \text{ into the demand equation to get } Q_d^* = 1000 - 2(200) = 600 \\
   \text{or substitute into the supply equation to get } Q_s^* = 3(200) = 600 \\
   \text{In either case, } Q^* = 600
   \]

13. If a price ceiling is set at $100, the quantity demanded will be (fill in the blank, show calculations below)
   
   \[
   \text{Substitute the price into the demand equation to get: } \\
   Q^* = 1000 - 2(100) = 800
   \]

14. If a price ceiling is set at $100, the quantity supplied will be (fill in the blank, show calculations below)
   
   \[
   \text{Substitute the price into the supply equation to get: } \\
   Q^* = 3(100) = 300. \\
   \text{Note that this implies an excess demand of } 800 - 300 = 500
   \]

15. As a result of the price ceiling, there will be:
   
   A. an excess demand for the good

16. Pareto optimality means that:
   
   A. no one can be made better off without making someone else worse off

17. Free markets will deliver Pareto optimal results:
   
   E. Only if all of the above conditions do NOT hold.

18. Price controls will always deliver results which are closer to Pareto optimality than the market.
   
   B. False

19. The market will always deliver results which are closer to Pareto optimality than can be achieved by legislation.
   
   B. False

Consider the following graph of a price floor:
20. The area $C + V + A$ represents:
   A. consumer surplus after the price floor.
   B. consumer surplus before the price floor.
   C. producer surplus after the price floor.
   D. producer surplus before the price floor.
   E. deadweight loss after the price floor.

21. The area $C$ represents: [same options as the previous question]

22. The area $W + M + P$ represents: [same options as the previous question]

23. The area $A + M$ represents: [same options as the previous question]

24. The area $I$ represents:
   A. The consumer share of deadweight loss.
   B. The producer share of deadweight loss.
   C. The producer surplus after the price floor.
   D. The total variable cost of production after the price floor.

25. The area $V + W + P$ represents: [same options as the previous question]

The following calculation questions require for any credit a clear presentation of exactly what area you are calculating. Show your calculations clearly and neatly (use the back of the previous page if you need to do some
26. What is the numerical value of consumer surplus before the price floor?
   Area of the triangle CVA = \( \frac{1}{2} \times (500 - 300) \times 40 = \frac{1}{2} \times 200 \times 40 = 4000 \)

27. What is the numerical value of consumer surplus after the price floor?
   Area of the triangle C = \( \frac{1}{2} \times (500 - 400) \times 20 = \frac{1}{2} \times 100 \times 20 = 1000 \)
   CS has decreased by $3000

28. What is the numerical value of producer surplus before the price floor?
   Area of the triangle WMP = \( \frac{1}{2} \times (300 - 100) \times 40 = 4000 \)

29. What is the numerical value of producer surplus after the price floor?
   Areas VWP of which:
   VW is a rectangle with height = (400 - 200) = 200 and base = (20 - 0) = 20, so area VW = $4000
   P is a triangle with height = (200 - 100) = 100 and base = 20, so area P = \( \frac{1}{2} \times 100 \times 20 = 1000 \)
   and the total producer surplus is area VW + area P = $5000
   PS has increased by $1000

30. What is the numerical value of deadweight loss after the price floor?
   Note that CS is down by $3000, and PS is up by only $1000, so the deadweight loss is $2000
   By direct calculation, the DWL is the triangular area labeled A and M, with
   height = (400 - 200) and base = (40 - 20) so
   area = \( \frac{1}{2} \times 200 \times 20 = 2000 \)