1. (#1, Ch 1) Jamal has a flexible summer job. He works every day but is allowed to take a day off anytime he wants. Of course, if he takes a day off, he doesn’t get paid. His friend Don suggests they take off work on Tuesday and go to the local Six Flags amusement park. The admission charge for the amusement park is $15 per person, and it will cost them $4 each for gasoline and parking. Jamal loves amusement parks and a day at the park is worth $45. However, Jamal also enjoys his job so much that he would actually be willing to pay $10 per day to do it.

   a. If Jamal earns $10 if he works, should he go to the amusement park? Explain.

   \[
   \text{Benefit} = 45 \\
   \text{Cost (including opportunity cost)} = 19 \text{ (admission, gas, parking)} + 10 \text{ (job enjoyment)} + 10 \text{ (lost wages)} = 39 \\
   \text{Benefit} > \text{Cost: Go to the amusement park!}
   \]

   b. If Jamal earns $15 if he works, should he go to the amusement park? Explain.

   \[
   \text{Benefit} = 45 \\
   \text{Cost (including opportunity cost)} = 19 \text{ (admission, gas, parking)} + 10 \text{ (job enjoyment)} + 15 \text{ (lost wages)} = 44 \\
   \text{Benefit} > \text{Cost: Go to the amusement park!}
   \]

   c. If Jamal earns $20 if he works, should he go to the amusement park? Explain.

   \[
   \text{Benefit} = 45 \\
   \text{Cost (including opportunity cost)} = 19 \text{ (admission, gas, parking)} + 10 \text{ (job enjoyment)} + 20 \text{ (lost wages)} = 49 \\
   \text{Benefit} > \text{Cost: Go to work!}
   \]

2. (#9, Ch 1) A group has chartered a bus to New York City. The driver costs $100, the bus costs $500 and tolls will cost $75. The driver’s fee is nonrefundable, but the bus may be canceled a week in advance at a charge of only $50. At $18 per ticket, how many people must buy tickets so that the trip need not be canceled?

   \[
   \text{Let } X \text{ = # of tickets sold} \\
   \text{Benefit} = 18X \\
   \text{Cost (marginal only!!)} = 450 \text{ (refundable part of bus)} + 75 \text{ (tolls)} = 525 \\
   \text{Go on trip if:} \\
   18X \geq 525 \quad \text{(divide both sides by 18)} \\
   X \geq 29.2 \quad \text{Because you cannot sell .2 of a ticket, you must have at least 30 tickets sold!}
   \]
3. Use this graph to answer the following questions:

![Graph of Market for Golf Lessons]

**a. Write an equation for the demand curve:**

*Inverse demand curve (P is the independent variable, Q^D is the dependent variable):* \( P = 50 - \frac{1}{2}Q^D \)

*Demand curve (solve for Q^D):* \( \frac{1}{2}Q^D = 50 - P \Rightarrow Q^D = 100 - 2P \)

**b. Write an equation for the supply curve:**

*Inverse supply curve:* \( P = \frac{1}{3}Q^S \)

*Supply curve (solve for Q^S):* \( P = \frac{1}{3}Q^S \Rightarrow Q^S = 3P \)

**c. Algebraically solve for the equilibrium and label this on the graph.**

*You can use either the demand and supply curves or the inverse demand and supply curves. Using the inverse demand and supply:*

*Two equations, two unknowns (in equilibrium Q^D = Q^S = Q^\prime):* \( P = 50 - \frac{1}{2}Q \) and \( P = \frac{1}{3}Q \)

\[
\begin{align*}
50 - \frac{1}{2}Q &= \frac{1}{3}Q \\
50 &= \frac{1}{2}Q + \frac{1}{3}Q \\
50 &= \frac{5}{6}Q \\
6 \cdot 50 &= Q \\
Q^\prime &= 60
\end{align*}
\]

*Substitute this into either the inverse supply or demand curve:*

\( P^\prime = \frac{1}{3} \cdot 60 = $20 \)

**d. How many golf lessons will be given if the price is $10? Will buyers or sellers be dissatisfied? Why?**

\[
\begin{align*}
10 &= 50 - \frac{1}{2}Q^D \Rightarrow 40 = \frac{1}{2}Q^D \Rightarrow Q^D = 80 \\
10 &= \frac{1}{3}Q^S \Rightarrow Q^S = 30
\end{align*}
\]

*30 lessons will be given. 50 buyers will be dissatisfied because they want to buy lessons at that price, but no one wants to give them. The price is too low, resulting in a shortage.*
e. How many golf lessons will be given will be sold if the price is $30? Will buyers or sellers be dissatisfied? Why?

\[ 30 = 50 - \frac{1}{2}Q^D \Rightarrow 20 = \frac{1}{2}Q^D \Rightarrow Q^D = 40 \]

\[ 30 = \frac{1}{3}Q^S \Rightarrow Q^S = 90 \]

40 lessons will be given. 50 sellers will be dissatisfied because they want to sell lessons at that price but no one wants to buy them. This is an excess supply or surplus because the price is too high.

5. (#9, Ch. 2)
Suppose the demand for apartments is \( P=1200-Q \) while the supply is \( P = Q \). The government imposes rent control (price ceiling) at \( P = $300/month \).

a. Graph the supply (\( S_0 \)) and demand (\( D_0 \)). Carefully label your axes.

b. Algebraically find the equilibrium price and quantity of apartments. Label these \( P^* \) and \( Q^* \) on the graph.

\[ 1200-Q = Q. \]
\[ 1200 = 2Q. \]
\[ Q^* = 600 \]
\[ P^* = $600 \]

c. What is the market disequilibrium caused by the rent control?
Demand: \( 300=1200-Q^D \Rightarrow Q^D = 900 \)
Supply: \( 300=Q^S \Rightarrow Q^S = 300 \)
Shortage = \( Q^D - Q^S = 900 - 300 = 600 \)

d. Suppose demand grows in the market to \( P = 1400-Q \). How is the market disequilibrium caused by the rent control affected?
Demand: \( 300=1400-Q^D \Rightarrow Q^D = 1100 \)
Supply: \( 300=Q^S \Rightarrow Q^S = 300 \)
Shortage = \( Q^D - Q^S = 1100 - 300 = 800 \), Much worse!!

e. At what price would the government have to set the rent control to keep excess demand at the same level as prior to the grown in demand?
\( P \text{ ceiling} = $400 \)
Demand: \( 400=1400-Q^D \Rightarrow Q^D = 1000 \)
Supply: \( 400=Q^S \Rightarrow Q^S = 400 \)
Shortage = $Q^D - Q^S = 1000 - 400 = 600$

f. What are some possible unintended consequences of rent control? *Black markets, poor quality housing*
5. In each of the following cases, discuss how the markets referenced in the articles have been affected. Using a supply and demand graph (label your axes), illustrate and verbally describe your ideas. Include a discussion of supply, quantity supplied, demand, quantity demanded, price and quantity.

a. Read: “Sugar price, at a boil” (available next to this homework) *Chicago Tribune* October 20, 2005.

**Sugar Market**

**Candy Market**

<table>
<thead>
<tr>
<th>Crop Failure</th>
<th>Holiday Season increases demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>This decrease in supply shifts the supply curve to the left which implies:</td>
<td>Higher price of sugar (input) reduces supply</td>
</tr>
<tr>
<td>$P^* \uparrow, Q^* \downarrow, Q^D \downarrow$</td>
<td>$P^* \uparrow, Q^* \uparrow, Q^D \uparrow$</td>
</tr>
<tr>
<td>At the same time, the holidays mean higher demand for sugar for baking:</td>
<td>Higher price of sugar (input) reduces supply</td>
</tr>
<tr>
<td>$P^* \uparrow, Q^* \uparrow, Q^D \uparrow$</td>
<td>$P^* \uparrow, Q^* \downarrow, Q^D \downarrow$</td>
</tr>
<tr>
<td>The govt released reserves of sugar, which shifts the supply curve to the right.</td>
<td></td>
</tr>
<tr>
<td>$P^* \downarrow Q^* \uparrow Q^D \uparrow$</td>
<td></td>
</tr>
</tbody>
</table>
b. From an economist’s perspective, is this really a “shortage” in cement? *This is true of $Q^D > Q^S$ because the $P^*$ is greater than the price that cement is selling for.* This seems unlikely because it is hard to imagine why the price wouldn’t just increase. The “shortage” probably just means that the price is really high.

c. Describe what other markets might be affected by the changes you described in the cement industry.
*The concrete industry and the housing industry (both use cement as an input).* Are there substitutes for cement? Complements?
6. Using the following webpage: [http://finance.cityoflansingmi.com/purchasing/livingwage.jsp](http://finance.cityoflansingmi.com/purchasing/livingwage.jsp) as a start and/or your own web search on the “Living Wage” in Lansing answer the following questions:

a. Who earns the “living wage” in Lansing?

Anyone who receives a service contract from the city of East Lansing for an amount above $50,000 must pay their workers the living wage.

b. What is the current “living wage” in Lansing?


It’s the wage necessary to go above 125% of the poverty line for a family of 4 if you work 40 hours/week and 50 weeks/year.

c. Suppose you are an intern for an individual who is running for City Council in Lansing. Your boss has asked you to prepare a 1 to 2 page typed memo concerning whether or not he or she should be in favor of this legislation. He or she depends on your training as an economist and he or she took an economics course in college, so you should definitely use graphs along with your description to make your point. Assume that the market rate for low-skilled workers in Lansing (equilibrium price) is $6 per hour. Your memo should address intended and unintended consequences. In addition, please discuss the consequences of limited who receives the “living wage” to those you listed in part a. You may want to consider an alternative solution and discuss its merits or pitfalls. Be as convincing and creative as possible.