1. (a) State the Law of Demand. (5 Points)
(b) State the Law of Supply. (5 Points)

a. Ceteris paribus, price and quantity demanded are negatively related

b. Ceteris paribus, price of the commodity and quantity supplied are positively related.
2. State the economic reasoning (as discussed in class) behind the law of demand. (10 Points)

- Substitution effect
  
  As price ↑ buyers substitute away from the good with other cheaper goods and decrease demand.
  
  Price ↑ ⇒ substitute away from good ⇒ Demand ↓

- Income effect
  
  As prices rise, buyer's real income decreases. Buyers have less purchasing power. As prices decrease, buyer's real income increases. Buyer will then have more purchasing power.
3. The laws of demand and supply dictate that the market settles at equilibrium. In other words, at the going price anyone that can afford to buy a rock concert ticket should be able to get one. However, the "Rolling Stones reserve reading" suggests that at the going price for concert tickets, there were vast shortages.

Draw a demand and supply graph to depict this phenomenon and explain what is going on in a few words. Next list the different non-price allocation methods that were used by the Rolling Stones to distribute the scarce tickets.

(10 Points)

There is shortage because there is scarcity. Although most people who want to buy a ticket can afford it (they have a demand), not all of them can because they are limited by factors such as venue capacity. The wants and the demands of the people exceed the resources available. Technically, this shortage should create competition between buyers and drive prices up, but the Rolling Stones understand that not only the wealthy enjoy their shows.

The methods used for the scarce tickets were to allow for radio stations to hold giveaways and to make tickets available at multiple locations. The Rolling Stones also held multiple concerts in one city so more people could see the show. They also allowed scalpers so the remainder of the people could compete.
5. Starting from a position of equilibrium in the hot dog market, the income of hot dog consumers decreases. Explain with graphs of the hot dog market what the new equilibrium price and new equilibrium quantity will be. Assume that hot dogs are an inferior good. Use the demand and supply model discussed in class to perform your analysis. (10 Points)
6. Draw a diagram of a PPF for a firm that faces constant opportunity costs
   in the production of both goods X and Y. (10 Points)

\[ \text{OC from } A \rightarrow B = \text{OC from } B \rightarrow C \]

\[ \text{OC of } X \text{ in terms of } Y \quad A \rightarrow B = \left| \frac{Y_2 - Y_1}{X_2 - X_1} \right| = \left| \frac{2 - 1}{2 - 1} \right| = \frac{1}{1} = 1 \]

\[ \text{OC of } Y \text{ in terms of } X \quad A \rightarrow B = \frac{1}{\left| \frac{Y_2 - Y_1}{X_2 - X_1} \right|} = \frac{1}{\left| \frac{2 - 1}{2 - 1} \right|} = \frac{1}{1} = 1 \]
Assume that goods X and Y are substitutes in production and substitutes in consumption. Starting from a position of equilibrium the price of Y rises. Explain with demand and supply graphs the impact of this price rise on the equilibrium price and equilibrium quantity of good X. Use the demand and supply model discussed in class to perform your analysis. (10 Points)

\[ \begin{align*}
\text{Substitutes in Consumption} \\
\text{Coke} &\Rightarrow \text{Pepsi} \\
&
\begin{align*}
&\downarrow P_Y, \uparrow D_Y \\
&\uparrow D_Y, \uparrow D_X
\end{align*}
\end{align*} \]

\[ \begin{align*}
\text{Substitutes in Production} \\
\text{Cars vs. SUVs} \\
&
\begin{align*}
&\downarrow P_Y, \uparrow S_Y \\
&\uparrow S_Y, \downarrow S_X
\end{align*}
\end{align*} \]

\[ P_X: Q_X = \]
8. Use Excel's Goal Seek Function to solve the following equations.

\[ Q_d = 10000 - 25P \]
\[ Q_s = 50P - 3000 \]

Be sure to show your work i.e. describe which menus you clicked on and show your calculations. USE A COMPUTER IN THE ECON LAB TO DO THIS PROBLEM. STAPLE YOUR PRINT OUT TO THE EXAM. DO NOT LOOK AT THE GOAL SEEK TUTORIAL DURING THE EXAM.

(10 Points)

1. First enter:

   A    B
   1 P= 10000 - 25*b1
   2 Qd= =10000-25*b1
   3 Qd-Qs= =b2-(50*b1-3000)

   which gives you \( Q_d = 10,000 \) and \( Q_d - Q_s = 13,000 \)

2. Select B3, go to the Tools menu, and click Goal Seek.

3. Enter To value: 0

   By changing cell: $B$1

   (click the button on the right of the row and then click on B1 to make this entry.)

4. Hit ok and the answer is that equilibrium price is \( P = 173.33 \) and quantity demanded is \( Q_d = 5666.667 \).

   \[
   \begin{array}{|c|c|}
   \hline
   A & B \\
   \hline
   1 & P= 173.3333 \\
   2 & Qd= 5666.667 \\
   3 & Qd-Qs= 0 \\
   \hline
   \end{array}
   \]
9. The following markets are described by the demand and supply equations. In each case solve the equations simultaneously to find the equilibrium price and equilibrium quantity in each market.

(a) $Q_s = -10 + 3P$ \text{(SUPPLY)}
$Q_d = 22 - 5P$ \text{(DEMAND)}

(b) $Q_s = -450 + 8P$ \text{(SUPPLY)}
$Q_d = 12 - 2P$ \text{(DEMAND)}

\begin{align*}
\text{(a)} & \quad -10 + 3P = 22 - 5P \\
& \quad \Rightarrow 8P = 32 \\
& \quad P = 4 \\
& \quad 3(4) - 10 = Q = 2
\end{align*}

\begin{align*}
\text{(b)} & \quad -450 + 8P = 12 - 2P \\
& \quad 10P = 462 \\
& \quad P = 46.2
\end{align*}

Since equilibrium $Q$ cannot be negative, there is no trade in this market.
10. Starting from a position of equilibrium, given that there is a decrease in the cost of production and that demand remains unchanged, what happens to equilibrium price and equilibrium quantity? Illustrate your answers with a demand & supply graph. Use the demand and supply model discussed in class to perform your analysis. (10 Points)

- A decrease in the cost of production means that more goods can be produced at the same price, the supply curve shifts to the SE.
  - Price decreases from $P_1$ to $P_2$;
  - $Q_{eq}$ increases from $Q_1$ to $Q_2$.