Each question is worth ten points. It is o.k. to ask me to clarify the questions on the exam. Remember to label all your graphs clearly. Also indicate in which directions the curves shift. It is to your advantage to explain your reasoning. State formulas explicitly with the definitions of all symbols on the numerical questions.

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

a) Ceteris Paribus, prices and quantity demanded are related negatively.

b) Ceteris Paribus, prices and quantity supplied are related positively.

(10)
2. State the economic reasoning (as discussed in class) behind the law of demand.
   (10 Points)

There are two main factors in the reasoning behind the law of demand:

Substitution → if a price goes up then due to the opportunity cost people/consumers will buy substitutes instead, therefore lowering demand.

Income effect → if income is fixed and prices increase it causes real income to decrease, therefore less is purchased of that good—demand decreases.

(10)
3. (a) Define Consumer Surplus (5 Points)
(b) Define Producer Surplus (5 Points)

(a) Consumer surplus is the difference between what a buyer could potentially be given (buyer's reservation price) and what they actually paid for a good. For example, if a buyer has $5 to spend on a bottle of coke and it actually costs $3, the consumer surplus is $2.

(b) Producer surplus is the area below the average price and the marginal cost. What a producer actually sells a good for, is the minimum price they are willing to sell it for (sellers' reservation price). For example, if a seller's reservation price for a jacket is $25 and they sell it for $45, the producer surplus is $20.
4. Starting from a position of equilibrium the expected future price of Coke rises. Explain with a graph of the Pepsi market what will happen to the equilibrium price and the equilibrium quantity of Pepsi. Assume that Coke and Pepsi are substitutes in consumption. Use the demand and supply model discussed in class to perform your analysis. (10 Points)
5. Starting from a position of equilibrium in the hot dog market the income of hot dog consumers increases. 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)

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Hot dogs are an inferior good, which means that as income decreases, quantity demanded increases, and as income increases, quantity demanded decreases. If the income of hot dog consumers increases, then the demand for it will decrease. A shift in the demand curve due to a change in an exogenous variable, income, This shift is represented by $O_2$ above. The new equilibrium lies to the left of the original equilibrium, at lower equilibrium price $(P)$ and quantity $(Q)$ decreasing. This occurs due to the decrease in demand causes a surplus, which drives down the price of hot dogs, while at the same time, the quantity demanded decreases at the same price.
6. Draw a graph of a PPF for a firm that faces constant opportunity costs in the production of both goods X and Y. (10 Points)
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{Market for Y} \\
&\begin{array}{c}
P \\
\text{Si} \\
Q_i \\
\end{array} \\
\text{Market for X} \\
&\begin{array}{c}
P \\
\text{Sz} & \text{S1} \\
P_z & P_i \\
Q & Q_1 \\
\end{array}
\end{align*}

Price for good X will rise but it is ambiguous to tell what quantity it will do. It could rise tall or stay the same.
q. (a) \[-10 + 3p = 22 - 5p\]
\[8p = 32\]
\[p = 4\]
\[q = 2\]

(b) \[-450 + 8p = 12 - 2p\]
\[10p = 462\]
\[p = 46.2\]
\[q = 12 - 92.4 = -80.4\]
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)

\[ P_1 \rightarrow P_2 \quad Q_1 \rightarrow Q_2 \]

Due to the decrease in cost of production, the supply increases causing the equilibrium to move down the demand curve.