Section I, Multiple Choice (30 points): Circle the letter in front of the best answer.

1. In the "Circular Flow of Economic Activity" diagram,
   a. firms supply resources and consumers demand products.
   b. producers supply resources and households demand products.
   c. households supply resources and firms supply products.
   d. households demand resources and firms demand products.

2. Which of the following is NOT a factor of production?
   a. Land
   b. Labor
   c. Entrepreneurship
   d. Services

3. A production possibilities frontier shows
   a. the prices at which alternative goods will be produced.
   b. the various combinations of two goods a country can produce with its resources.
   c. the maximum amount of resources which can be used to produce two goods.
   d. the input combinations that allow a country to produce a given amount of output.

4. How do we illustrate the concept of Increasing Opportunity Costs on a concave production possibilities frontier?
   a. As we move to the right along the frontier, increasing amounts of the vertical good must be given up to produce more and more of the horizontal good.
   b. As we move from the interior of the production possibilities frontier to the edge of the frontier, increasing amounts of either the horizontal good or the vertical good or both can be produced.
   c. As we move to the right along the frontier, increasing amounts of labor and capital must be purchased to allow us to stay on the frontier.
   d. As we move to the right along a production possibilities frontier, increasing amounts of the horizontal good must be supplied to meet the demand for the vertical good.

5. In a two-nation world, if Nation A is absolutely better than Nation B at producing both agricultural goods and manufacturing goods,
   a. neither nation can gain from specialization and exchange.
   b. both nations can gain from specialization and exchange.
   c. only Nation A can gain from specialization and exchange.
   d. only Nation B can gain from specialization and exchange.

6. Which of the following items is true of the equilibrium price?
   a. It is the price at which the quantity supplied is equal to the quantity demanded.
   b. It is the price at which the excess demand is greater than the excess supply.
   c. It is the only price for which there is no tendency to change.
   d. All of the above are true.
   e. Only (a) and (c) are true.

7. One reason why a supply curve reflects a positive relationship between the price and the quantity supplied is that
   a. an increase in the price increases seller profits and gives producers an incentive to supply a larger quantity.
   b. an increase in input prices increases supply.
   c. a decrease in input prices decreases supply.
   d. as more units are produced, costs per unit of production are lower.
8. Wheat is the main input in the production of flour. If the price of wheat increases, all other things being equal, we would expect
   a. the supply of flour to be unaffected.
   b. the supply of flour to increase.
   c. the supply of flour to decrease.
   d. the demand for flour to decrease.

9. A "normal" good is one for which
   a. demand increases with an increase in income.
   b. supply increases with an increase in income.
   c. demand decreases with an increase in income.
   d. supply decreases with an increase in income.

10. The law of demand says that price and the quantity demanded are inversely related because of
    a. the quantity effect and the price effect.
    b. the substitution effect and the income effect.
    c. the equilibrium effect and the dis-equilibrium effect.
    d. the opportunity cost effect and the efficiency effect.

11. If two countries who had been producing and consuming on their own now open trade with one another,
    a. the price will rise in both countries.
    b. the price will fall in both countries.
    c. the price will fall in the low price country and rise in the high price country.
    d. the price will rise in the low price country and fall in the high price country.

12. An expectation of a future price increase will shift
    a. both the supply function and the demand function to the left.
    b. both the supply function and the demand function to the right.
    c. the supply function to the right and the demand function to the left.
    d. the demand function to the right and the supply function to the left.

13. If a price ceiling is placed on what had been a freely traded good, the quantity demanded will be
    a. greater than, supplied
    b. less than, supplied
    c. greater than, demanded
    d. less than, demanded

14. The price elasticity of demand
    a. indicates how far consumers can stretch their budgets.
    b. measures how much the price will rise if demand increases.
    c. measures how much the quantity demanded will respond to a price change.
    d. indicates whether a good is "normal" or "inferior."

15. Demand for a good will be more elastic if
    a. the time frame in which a purchase decision must be made is relatively short.
    b. the good is a high-priced good.
    c. there are a limited number of consumption substitutes for the good in question.
    d. none of the above.

Section II, Direct Questions (30 points): Answer each of the following six questions. You will be graded on your best five responses.
1. On a two-dimensional graph, with H-goods measured along the horizontal axis and V-goods measured along the vertical axis, how would technological innovation that enhanced the production of both H-goods and V-goods be shown on a Production Possibilities Frontier? Would consumption of H-goods increase, decrease, or remain the same? Explain.

![Diagram showing Production Possibilities Frontier]

- An increase in both the H and V intercepts
- Consumption of H-goods could increase, decrease, or remain the same but it would not likely decrease.

2. Draw a concave (curved) production possibilities frontier. Denote and label points that are efficient (E), inefficient (I), attainable (A), and unattainable (U). Then briefly explain what we mean by each of these terms.

- Attainable: On or inside the PPF
- Unattainable: Outside
- Efficient: On the PPF (max possible prod'm)
- Inefficient: Inside the PPF → more could be produced...

3. Two reasons were given in class as to why a supply curve reflects a positive relationship between the price of the good and the quantity supplied. Name and explain these two reasons.

1. Profitability: See MC #7

2. Costs: We learned from concave PPF's that greater specialization/production led to increasing opportunity costs.
4. If a market is in equilibrium, and then both the demand curve and the supply curve shift to the right, what will happen to the equilibrium price and the quantity transacted? Explain.

\[ \text{If } Q_0 \text{ will certainly increase to } Q_1, \text{ but the price change is indeterminate without further information.} \]

\[ \rightarrow \text{It depends on the magnitude of the shifts.} \]

5. If goods A and B are consumption complements, an increase in the price of good A will cause a shift in either the supply of or the demand for good B. Which function is shifted, and in which direction (increase or decrease)? Explain.

CC: Bacon + eggs...

An increase in the price of bacon will cause less bacon to be purchased/consumed, so less eggs will be purchased also.

\[ \rightarrow \text{Demand} \]

\[ \rightarrow \text{Decrease} \]

6. In order to increase tax revenues, the government decided to put a ten percent “luxury tax” on houseboats. However, tax revenues actually DECREASED instead of increasing. How do you explain this unfortunate outcome?

Houseboat demand is elastic. With an increase in the price, a smaller quantity would be demanded, and the 0.1m Qd will be more than 10%, more than offsetting the price increase due to the tax.
Section III-A (10 points): Use the table below to answer the following questions:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Guns</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Toys</td>
<td>20</td>
<td>16</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

1. On the graph to the right, construct the Production Possibilities Frontier associated with the numbers in the table.

2. What is the maximum amount of toys that can be produced if 4 guns are produced? 4

3. What is the opportunity cost of the third gun produced?

\[
\frac{-20T}{+5G} = \frac{-4T}{+1G}
\]

4. Add a new combination to the chart, at 4 guns and 12 toys. What does this point represent? Unattainable

5. Do the data and associated graph reflect constant or increasing opportunity costs? Explain.

Constant OC : equal to the slope of the line for all output combinations

Section III-B (15 points): You are given the following demand and supply equations for lobster (dollars per kilogram) in Norway and Sweden.

Norway: \( Q_s = -120 + 8P \quad Q_d = 168 - 4P \)

Sweden: \( Q_s = 8 + 3P \quad Q_d = 360 - 5P \)

1. Calculate the no-trade equilibrium prices and quantities transacted in each country.

\[
\begin{align*}
\text{Norway:} & \quad -120 + 8P = 168 - 4P \\
& \quad 12P = 288 \\
& \quad P = 24 \\
& \quad Q_s = 72 \\
& \quad Q_d = 72 \\
\end{align*}
\]

\[
\begin{align*}
\text{Sweden:} & \quad 8 + 3P = 360 - 5P \\
& \quad 8P = 352 \\
& \quad P = 44 \\
& \quad Q_s = 140 \\
& \quad Q_d = 140
\end{align*}
\]
Re-stating the equations:
Norway: \( Q_s = -120 + 8P \) \( Q_d = 168 - 4P \)
Sweden: \( Q_s = 8 + 3P \) \( Q_d = 360 - 5P \)

2. If the Swedish government imposes an $40 price on the sale of lobster in their country, what would be the outcome in the Swedish lobster market? Please explain and provide a numerical answer.

\[ Q_s = 8 + 3(40) = 128 \]
\[ Q_d = 360 - 5(40) = 160 \]
\[ x_d (shortage) = 32 \]

A price ceiling -- keeps the price from rising to its naturally occurring equilibrium level.

Calculate the elasticity of demand in Sweden at this $40 price.

\[ \varepsilon = \text{coeff} \times \frac{P}{Q} \]
\[ = -5 \left( \frac{40}{160} \right) = \frac{-200}{160} = -1.25, \text{ elastic} \]

If we were to change the "slope" coefficient in the Norway supply equation from 8 to 6, would this change be an increase in supply or a decrease in supply? Show or explain.

A decrease in supply

Equim Q would decrease:
\[-120 + 6P = 168 - 4P \]
\[10P = 236 \quad P = 23.6 \quad Q = 54.4 \]

3. If Norway and Sweden trade with each other, calculate the "world" equilibrium price.

\[
(\cdot -120 + 8P) + (8 + 3P) = (168 - 4P) + (360 - 5P)
\]
\[-112 + 11P = 528 - 9P \]
\[20P = 640 \]
\[P = 32\]

Calculate the production and consumption levels in each country.

Norway:
\[ Q_s = -120 + 8(32) = 136 \]
\[ Q_d = 168 - 4(32) = 40 \]
\[ x = 96 \]

Sweden:
\[ Q_s = 8 + 3(32) = 104 \]
\[ Q_d = 360 - 5(32) = 200 \]
\[ x_d = 96 \]

How much lobster will be exported? 96

...imported? 96
Section III-B, Problems (15 points): The graphs below represent the national market for *Salties* Potato Chips (a *Pringles* "copycat"). $P_0$ and $Q_0$ are the initial supply-demand equilibrium prices and quantities. Four events are listed that affect the *Salties* Potato Chips market. For each of the events, *show the impact of the event graphically*. State the impact on the price (Increase, Decrease) and on the quantity transacted (Increase, Decrease). Each case involves a modification of the original graph. Analyze each case independent of the other cases.

1. Scientists at *Salties* Potato Chips develop a new chip manufacturing process that reduces cooking time by fifty percent with only negligible impacts on the taste.

   Equilibrium Price: $P_0$ / $Q_0$
   Quantity Transacted: $Q_0$ / $Q_0$

2. A major potato disease hits Idaho farmers, leading to a thirty percent reduction in the nation's potato harvest.

   Equilibrium Price: $P_0$ / $Q_0$
   Quantity Transacted: $Q_0$ / $Q_0$

3. A positive link is discovered between a food poisoning epidemic (15,000 ill in California) and consumption of *Salties* Potato Chips.

   Equilibrium Price: $P_0$ / $Q_0$
   Quantity Transacted: $Q_0$ / $Q_0$

4. Because their market share has declined, *Pringles* engages in a price war with *Salties*, lowering *Pringles* prices by 20 cents a can (suggested retail price for *Salties* had been set at $1.99 a can).

   Equilibrium Price: $P_0$ / $Q_0$
   Quantity Transacted: $Q_0$ / $Q_0$

5. Increased television advertising by *Salties* management leads to a twenty percent increase in grocery store placements of *Salties* Potato Chips.

   Equilibrium Price: $P_0$ / $Q_0$
   Quantity Transacted: $Q_0$ / $Q_0$