A. Multiple Choice (32 pts) Place answers (A, B, C, D or E) ON TEST in the space provided.

1. Which of the following will cause the equilibrium price to be higher than before:
   A. An increase in demand and a decrease in supply.
   B. An increase in both demand and supply.
   C. A decrease in both demand and supply.
   D. An increase in supply and a decrease in demand.
   E. A subsidy given to producers of the product.

2. An increase in the supply of carrots could be caused by ALL but which of the following:
   A. An increase in the price of carrots.
   B. A decrease in the wages of workers employed to harvest carrots.
   C. An improvement in pesticides which makes it cheaper to grow carrots.
   D. An increase in the number of carrot producers.
   E. None of the above because all will increase the supply of carrots.

3. If supply increases and the revenue increases but by a smaller percentage than the price increase, we know that the elasticity of demand must be:
   A. Equal to zero.
   B. Between zero and 1.
   C. Equal to 1.
   D. Between 1 and infinity.
   E. Equal to infinity.

4. When there is a price floor (and the government does not buy the surplus), the more elastic the demand:
   A. The greater the dead weight loss.
   B. The greater the consumer surplus lost from the floor.
   C. The greater the producer surplus gained from the floor.
   D. The greater the cost to government.
   E. The greater the shortage of the product.

5. What happens when the price of X increases (X on the X axis)?
   A. The marginal utility of X decreases.
   B. The marginal rate of substitution decreases.
   C. The budget constraint becomes steeper.
   D. The income consumption curve shifts to the right.
   E. The price consumption curve for X shifts to the right.

6. Pam is at equilibrium and moves to a new equilibrium after the price of X rises. At the new equilibrium:
   A. Pam will have more utility from her consumption of X.
   B. If X is normal then Pam will consume more of X.
   C. If X is normal, the marginal utility from the last X consumed will be higher than before.
   D. The amount of Y consumed must have increased.
   E. The amount of money Pam spends must increase.

   Suppose at a point in X, Y space the indifference curve through that point is flatter than the budget constraint through that point. This means: (X on the X-axis, Y on the Y-axis) you should:
   A. Lower the price of X to be able to afford the happiness at this point.
   B. Raise the price of X to be able to afford the happiness at this point.
   C. Reduce your consumption of X and raise your consumption of Y to increase your utility for the same spending.
   D. Raise your consumption of X and lower your consumption of Y to increase your utility for the same spending.
   E. You should increase your income to be able to afford the level of happiness at this point.
8. If the income effect is larger than the substitution effect, then: (CAREFUL!)
   A. The good must be an inferior good
   B. The income effect will move in the opposite direction of the substitution effect.
   C. If the good is normal, then the demand curve will have a positive slope.
   D. The intermediate point must be at a smaller X than the initial equilibrium (if the price of X rises)
   E. The good could be normal or inferior.

B. Comparative Statics (26 pts) YOU MUST SHOW YOUR WORK!!!
   The market for carrots is: 
   \[ \frac{dQ}{dP} = \frac{\text{P}}{\text{PRE}} \]
   PRICE:
   QUANTITY DEMANDED:
   QUANTITY SUPPLIED:
   1. \[ e = \frac{\text{P}}{\text{PRE}} = \frac{82}{11} \text{ inelastic} \]
   2. \[ e = 4 \left( \frac{\text{P}}{\text{PRE}} \right) = 8 \text{ elastic} \]
   3. \[ P = 5.625 \ Q = 22.5 \]
   4. \[ \frac{d\text{P}}{d\text{Q}} = -1.18 \text{ (independent)} \]
   5. Complete the following table indicating the predicted results if the government makes consumers pay a $3 tax for every unit of carrots they buy. (Use the original demand, not the one changed from the rise in income)

C. Utility and Demand (32 pts) Utility and Demand (33 pts) SHOW WORK for partial credit.
   Answers in space on test.
   \[ U = X Y - X^2/4 \]
   \[ dU/dX = Y - X/2 \]
   \[ dU/dY = X \]
   \[ X = 20, Y = 21 \]

Now, suppose \( P_x \) falls to $2.

5. \[ X = 14, Y = 21, U = 245 \]

4. \[ X = \frac{20}{Py=2} \]

7. Suppose we adjusted the income level so you would have the same happiness that you
used to have (before the price of X fell) although you are now paying the lower price of X. What combination of X and Y would give you this old happiness at the new price of X? (HINT: Solve for X first)
8. Draw a simple diagram showing the old equilibrium, the new equilibrium, the two ICC curves, the two indifference curves and the intermediate point. Carefully label the income and substitution effects.

\[ y = x \]
\[ y = \frac{3}{2}x \]
\[ U = 24.5 \]

D. Short Essay (10 pts) Write no more than two or three paragraphs on a lined sheet. You MUST illustrate your essay with a suitable well-labelled diagram which you will explain in your essay.

What will do more harm for the local economy if the demand and supply curves fully reflect people's tastes and opportunities....

Plan A: A minimum wage law (a law forcing employers to pay at least this wage) set at $2 above the equilibrium wage rate.... Or

Plan B: A $2 (per hour) tax that all companies must pay the government for every worker who receives the low equilibrium wage rate.

Explain.

\[ DWL_{Floor} > DWL_{tax} \] (Plan A)  \[ DWL_{tax} \] (Plan B)