Write your name on the cover of the test booklet and nowhere else. Enclose this sheet with the booklet. Failure to follow these directions will cost you 1 point. The test has 240 points (to be scaled down to 200 points) and is scheduled to take 120 minutes. Therefore, expect to spend 1 minute for every 2 points. For example, a 16-point question should take 8 minutes. I can give some extra time because there is no test after this, but I will not give much extra time.

1) (10 points) Using the graph to the right, tell me EITHER whether the goods are substitutes or complements OR whether or not either good is inferior. Explain your logic.

2) (10 points each) For TWO of the following, estimate the elasticity. Explain how you reach that conclusion.
A) Elasticity of supply for drinking water in this area.
B) Income elasticity of demand for used cars.
C) Own-price elasticity for pens.

3) (12 points each) For TWO use the table to the right to calculate the following elasticities in the manner described. What does that information tell you?
A) Own-price elasticity using the arc formula.
B) Cross-price elasticity using the point formula.
C) Income elasticity using the arc formula.

P_{apple}	P_{corn}	Income	Q_{apple}
42	5	294	100
38	6	294	102
42	6	294	98
42	6	306	102

4) (14 points) Answer EITHER Part A OR Part B.
A) What is the difference between the price-consumption curve and the demand curve?
B) Use the graph to the right to rank the points. If the person is facing BC_0 then they choose Point A, but if they are facing BC_1 then they choose Point C. Explain your logic.

5) (14 points) Answer EITHER Part A OR Part B.
A) Suppose you had two expected payoffs. The first possibility has a 70% chance of occurring and a payoff of $130. The second option has a 30% chance of occurring and a payoff of $30. Calculate the expected payoff and standard deviation. Show all work.
B) Does the Laspeyres Price Index overestimate the cost of inflation or underestimate it? Without drawing a graph, explain your conclusions.
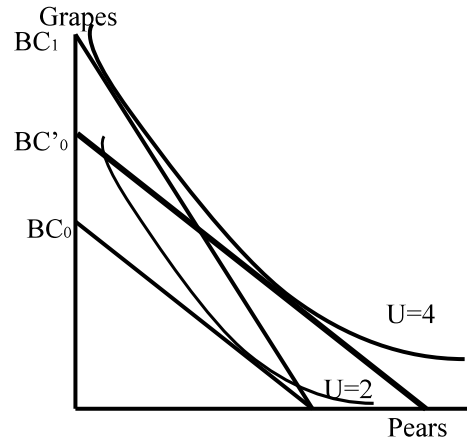
6) (18 points) Answer EITHER Part A OR Part B.
A) Draw the supply and demand for a good which has a price floor on it. Find the consumer surplus, producer surplus, subsidy cost, and deadweight loss for before and after the floor assuming the government pays them to not produce the good. Explain how you found all areas.
B) Draw the supply and demand diagram for a good which we import. Draw the effects of an import tariff. Find the consumer surplus, producer surplus, tax revenue, and deadweight loss for before and after the tax. Explain how you found all areas.

7) (18 points) Answer EITHER Part A OR Part B.
A) Draw the graph of utility as a function of income for a risk averse person. Suppose they have a 80% probability that nothing goes wrong so they will have $30,000, but a 20% probability that they only have $10,000. Draw the
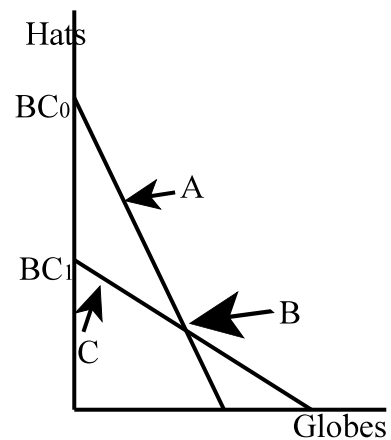
diagram and estimate how much they would be willing to pay to get insurance against the bad incident.

B) Draw the diagram with expected return and standard deviation on the axes. Set the market return as 4% and the risk free return as 1%. The standard deviation for the market is 2 percentage points. Draw the indifference curve such that you have 80% in the market. What is the expected return on your portfolio and its standard deviation? Briefly explain how you drew the line, know that you are 80% in the market, and how you found the expected return and standard deviation.

8) (18 points) Answer EITHER Part A OR Part B.

A) Suppose your utility function for raisins, R, and cashews, C, is given by $U(C, R) = C^3R$. The price of a box of raisins costs $2/box and the cost of a box of cashews is $3/box. If your income is $64, then how much of each would you buy to maximize your utility? Show all work.

B) Suppose the production function was given by $Q = KL$, $w = \$4/L$, and $r = \$1/K$. Use the Lagrangian to find the total cost function. **Do not** worry about the ATC and MC functions. Show all work.

9) (20 points) Answer EITHER Part A OR Part B.

A) Draw the indifference curve/budget constraint diagram with three indifference curves for two goods which result in a corner solution. Explain how you know your graph will give a corner solution Explain your logic.

B) Suppose the price of hats had been $4/unit last year. Last year the price of vests was $5/unit. Draw the budget constraint assuming your income is $40. Draw a normally shaped indifference curve tangent to it. If this year the price of a hat is $8/unit and the price of a vest is $2.50/unit, then draw the budget constraint which could be used to find the Paasche Price Index and the budget constraint which is what you would use to calculate the real harm from the price changes. Briefly explain how you found each of the three lines.

10) (24 points) Answer EITHER Part A OR Part B.

A) Draw the ATC/AVC/MC/D/MR diagram for a perfectly competitive firm which is making zero profits. Do not worry about the industry graph. Illustrate the effects of an increase in the rent on the building. Explain why the curve(s) moved as drawn. Do not worry about the long-run.

A) Draw the ATC/AVC/MC/D/MR diagram for a perfectly competitive firm which is making zero profits. Do not worry about the industry graph. Illustrate the effects of an increase in the electricity. Explain why the curve(s) moved as drawn. Do not worry about the long-run.

11) (30 points) Answer EITHER Part A OR Part B.

A) Use an indifference curve/budget constraint diagram for glasses versus rings. Use it to derive two points on the Engel curve for rings. You must use a scale and exact prices on your graph. Show all calculations and briefly explain what you did.

B) Use an isoquant/isocost diagram to draw two of each line. Use that data to graph two points on the LRTC line. You must use a scale, have exact values for w, r, and Q. Show all calculations and briefly explain what you did.

12) (30 points) Answer EITHER Part A OR Part B.

A) Draw two isocost lines which have the wage rate equal to 1/3 of the rental rate. Then draw two additional isocost lines which have the wage rate equal to 1/2 of the rental rate. Draw the appropriate isoquants and the expansion paths. Explain why the curve(s) moved as drawn.

B) Draw the ATC/AVC/MC/D diagram for a firm and beside it the S/D diagram for the industry. Have the firm making positive profits. Show what happens over time assuming it is an increasing cost industry. Explain why the lines moved as drawn.