Economics 204       Problem Set 5
Print this out and draw your diagrams on a separate sheet of paper so you can make them large—especially with income and substitution effects, large diagrams are MUCH easier to see and for you to study from later.

1. Draw a clearly labeled diagram with indifference curves and budget constraints indicating the income and substitution effects for
   a. A price increase—the good is normal
   b. A price increase—the good is inferior, but not a Giffen good
   c. A price decrease—the good is normal
   d. A price decrease—the good is inferior

2. When price increases, the quantity demanded typically decreases. Give an intuitive explanation (as opposed to a diagram) of the income effect and the substitution effect when the price of a good increases. For simplicity, assume it is a normal good.

3. Sharon can work up to 24 hours a day. Her wage is $10 an hour.
   a. Draw her budget constraint. Be sure to label all intercepts.
   b. What is the slope of the budget constraint? Explain how the slope relates to an opportunity cost.
   c. Suppose that Sharon is subject to a 50% tax on all income over $50 a day. Draw the new budget constraint, clearly labeling the intercepts.
   d. If income and leisure are both normal goods, will she work harder, spend more time enjoying leisure, or can you say? Indicate the income and substitution effects in your diagram.
   e. Suppose that instead of a tax, the government gives Sharon $10 in welfare payments if her income is less than $50. For example, if her income is $49, the government still gives her $10, but once her income is $50, Sharon receives nothing from the government. Draw the new budget constraint. Can you say how this plan might affect Sharon’s incentives to work?

4. George S. Oros has $1000 today and expects to receive $1000 a year from now. His savings account pays an annual interest rate of 25%. The bank is also willing to lend money at the same interest rate.
   a. Suppose that George saves all of your money to spend next year. How much money will he be able to spend today and next year?
   b. Suppose that he borrows $800 and spends $1800 today. How much will he be able to spend next year?
c. Draw a budget constraint with “spending today” on the x-axis and “spending next year” of the y-axis. What is its slope? How does this reflect the relative price (price ratio) of spending today in terms of spending next year?

d. Suppose George chooses to neither borrow nor save. Illustrate this optimal point with the budget line with an indifference curve.

e. Suppose that George was neither borrowing nor saving, as in part (d). Now the interest rate rises to 50%. Show how the budget line shifts above. Does George increase or decrease current spending? Does he increase or decrease future spending? Is he better off or worse off?

f. For part (e), decompose the change in consumption into an income and a substitution effect.

g. Now suppose instead that George is a saver when the interest rate is 25%. Draw a new diagram with the same budget constraint and a new indifference curve that illustrates this. Again assume the interest rate rises to 50%. Will George increase or decrease current spending or can you say? Illustrate the income and substitution effects for a saver.