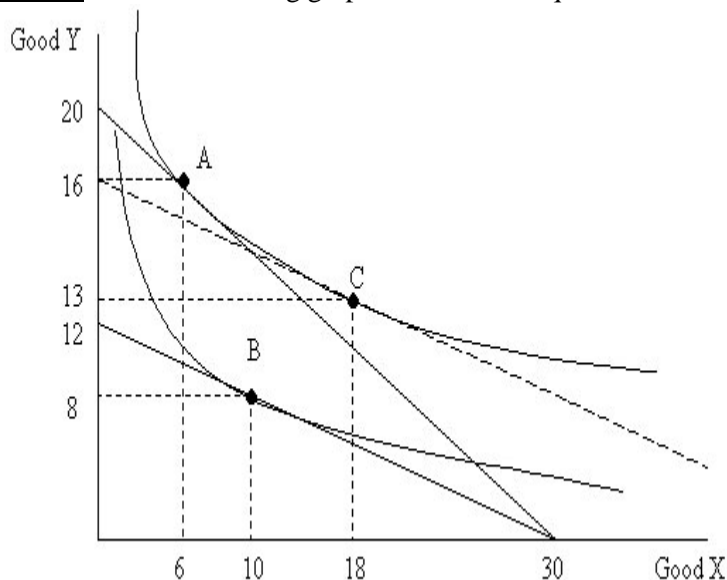**Problem 1:** Use the following graph to answer the questions.


a.   From the graph, which good has the price change? Did the price go down or up? What is the fraction of the new price relative to the original price?

b.   Using the points A – C, explain what movement shows the substitution effect, the income effect, and the price effect (total effect).

c.   Is good X a normal good or an inferior good? Is good Y a normal good or an inferior good?

d.   Derive the condition that good X becomes an inferior good. (i.e. X is an inferior good if x-value of point B is {less, more, equal to} than _____.) Derive the same condition for Y.

e.   From the graph, are X and Y complements or substitutes? Explain.

Homework 5   Due on: Oct 25-16, 2012

Problem 2: Income and Substitution Effects
A consumer has income of $3,000. Wine costs $3 a glass, and cheese costs $6 a pound.
   a.   Draw his budget constraint (put cheese on the horizontal axis). What is the slope of her budget constraint?
   b.   Consumer's indifference curves for wine and cheese are shown on the graph below. Use this graph to describe and explain the properties of the indifference curves.
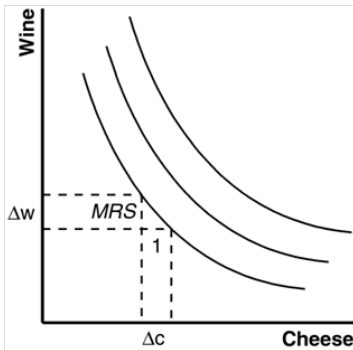
   c.   Given the prices of wine and cheese, what would be the marginal rate of substitution at the point that corresponds to the optimal consumption choice? What does the marginal rate of substitution tell us?
   d.   A person who consumes wine and cheese gets a raise, so his income increases from $3,000 to $4,000. Show what happens if both wine and cheese are normal goods. (draw graph)
   e.   Now show what happens if cheese is inferior good. (draw graph)
   f.   The price of cheese rises from $6 to $10 a pound, while the price of wine remains $3 a glass. For a consumer with a constant income of $3,000, show what happens to consumption of wine and cheese. Decompose the change into income and substitution effects. (draw graph)
   g.   Can an increase in the price of cheese possibly induce a consumer to buy more cheese? Explain.

Homework 5   Due on: Oct 25-16, 2012

Problem 3: Identifying Income and Substitution Effects

The notation below works as follows: A is the original bundle, B is the new bundle after the change, and C is the "in-between" bundle.
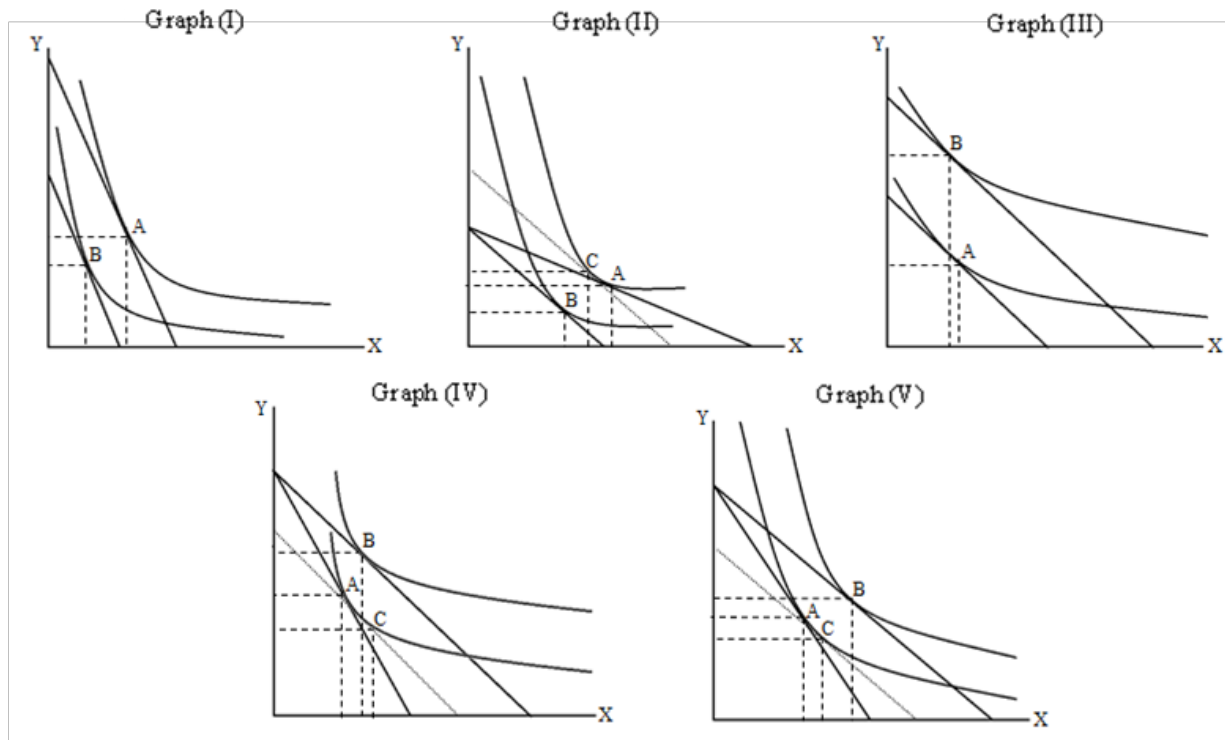
a. Of the above graphs, _____ show(s) an increase in the price of good X and _____ show(s) an increase in income.

b. In which of the graphs is X a normal good?

c. In which of the graphs is X an inferior good?

Problem 4: Perfect Substitutes and Budget Constraints

Connie has a monthly income of $200 that she allocates among two goods: meat and potatoes.

a. Suppose meat costs $4 per pound and potatoes $2 per pound. Draw her budget constraint.
   Let M = meat and P = potatoes.

b. Suppose also that her utility function is given by the equation U(M, P) = 2M + P. What combination of meat and potatoes should she buy to maximize her utility? (*Hint*: Meat and potatoes are perfect substitutes.)

c. Connie's supermarket has a special promotion. If she buys 20 pounds of potatoes (at $2 per pound), she gets the next 10 pounds for free. This offer applies only to the first 20 pounds she buys. All potatoes in excess of the first 20 pounds (excluding bonus potatoes) are still $2 per pound. Draw her budget constraint. (This is a hard one. You gains extra bonus if trying this)

d. An outbreak of potato rot raises the price of potatoes to $4 per pound. The supermarket ends its promotion. What does her budget constraint look like now? What combination of meat and potatoes maximizes her utility?