Homework Assignment #3: Utility Maximization

Name:

1. Draw a graph with oranges on the X axis and apples on the Y axis.
    a. Assume that your income is $100 and that oranges cost $4 a pound while apples cost $2 a pound. Draw a budget constraint line and an indifference curve tangent to the line.

    b. What is the marginal rate of substitution (MRS) between apples and oranges?

    c. Now suppose the price of oranges increases to $5 a pound. On your previous graph draw the new budget constraint and a new indifference curve tangent to it.

    d. Are you better or worse off now? How has your consumption of apples and oranges changed?

2. Solve question one analytically, using algebra, given the utility function: $U=X^2Y$. That is to say, maximize U subject to the constraint: $I=P_yY+P_xX$. (Hint use the Lagrange method).

3. John's utility function is defined as: $U=2\ln X+\ln Y$.
    a. Assuming that his income is $72 and that the price of X is $2 and the price of Y is $4, what is his utility maximizing amount of X and Y?

    b. If you solved the first part of the question using Lagrange, now solve it by using the person's marginal rate of substitution ($MU_x/P_x=MU_y/P_y$).