

Economics 101
Spring 2005
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Homework #3
Due: Wednesday, 9th in lecture.

1. Suppose Sammy only consumes 2 goods, wooden pencils and mechanical pencils. Also, Sammy considers two wooden pencils to be a *perfect* substitute for one mechanical pencil.
 - (a) Draw a few of Sammy's indifference curves (at least four).
 - (b) Suppose that Sammy makes \$12 dollars per week and that mechanical pencils each cost \$3 and that wooden pencils each cost \$2. Draw Sammy's budget line. What is the equation of this line?
 - (c) What is Sammy's optimal consumption bundle? How many wooden pencils and how many mechanical pencils will Sammy consume each week?

2. Using table (1), suppose that apples cost \$1 each and tacos cost \$2 each. If Sally has income equal to \$9, how much of each will she consume and why?

Apples		Tacos	
Quantity	Total Utility From Apples	Quantity	Total Utility From Tacos
0	0	0	0
1	5	1	10
2	9	2	18
3	12	3	24
4	15	4	28
5	16	5	30

Table 1: *Sally's utility from taco and apple consumption.*

3. Suppose Jane consumes two goods, x and y . The utility that Jane receives from consuming these two goods is given by $U(x, y) = xy$. Thus, if she consumes 4 units of x and 5 units of y she will receive total utility equal to $5 \cdot 4 = 20$.
- Draw indifference curves for $U(x, y) = 2$, $U(x, y) = 4$, $U(x, y) = 6$ and $U(x, y) = 8$.
 - Suppose that the price of good x is $p_x = \$4$ and the price of good y is $p_y = \$2$ and that Jane has income of $I = \$16$. Draw in *and* give the equation for Jane's budget line. Label this budget line BL_1 in your graph.
 - Given the indifference curves you've drawn from part (a) and the budget line you've drawn from part (b), what is Jane's optimal consumption bundle? (Hint: look at the different possible consumption bundles on the budget line and see which one yields the highest utility. You need only check integer values for x and y).
 - How much utility does Jane receive from this consumption bundle?
 - Suppose now that the price of good y quadruples to $p_y = \$8$. Draw the new budget line and find the new optimal consumption bundle. Label this new budget line BL_2 in your graph.
 - What is the smallest amount of income Jane would need at these new prices to get her back to her original indifference curve? (Hint: Find values of x and y that give her the same utility as in part (d). You need only check integer values of x and y . Which one of these - at the new prices - requires the smallest amount of income?)
 - Label the original consumption bundle point A , the new consumption bundle point B and the hypothetical consumption bundle she would consume with additional income found in part (f) - label this point C .
 - Clearly** label the substitution effect on good y created by the price increase. How much is this amount? (Hint: The substitution and income effects will be measured as changes in good y since it is the price of good y that changes in this example.)
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 - Is good y a normal or inferior good?