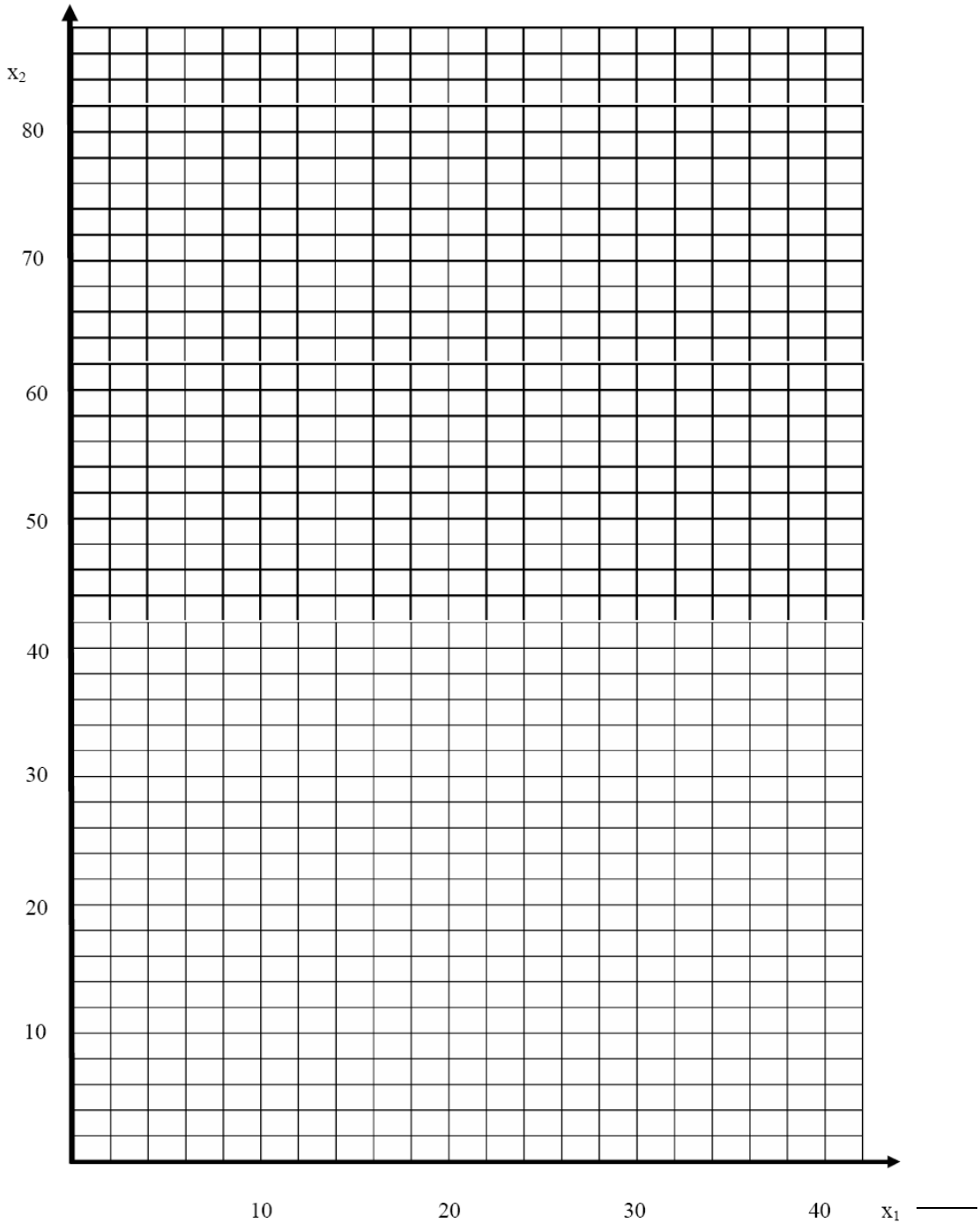
Problem Set #2 Econ21 – Summer 2007 *W. Gick*

Posted July 19, presentations in class July 25 of problems marked with a ""*

1) Solve the workbook questions: *#7.1, *#7.8

*2) Alice in Wonderland got her own orchard, with cherry trees and almond trees. Each year she harvests 24 baskets of sublime tasting cherries (good 1) and 16 baskets of fresh almonds (good 2). Alice is also a Cobb-Douglas consumer and has a utility function of $u(x_1, x_2) = 5x_1^2 x_2^6$.

a) Find her individual demand function for cherries and almonds by using the Lagrange method. Use $p_1 x_1 + p_2 x_2 = m$ for the budget line.



b) Draw her endowment bundle into the graph above. Prices in wonderland are $p_1 = 2$ and $p_2 = 1$. Find her initial income. Compute her initial consumption bundle A and mark it in the graph below, together with the budget line (mark this budget line with "m=..").

c) Wonderland's price authority (unfortunately, they don't have free markets) decides to increase the price for cherries to $p_1' = 3$. Find Alice's income compensation so that she is still able to consume bundle A at new prices. Compute Point B and mark it into the graph above. Draw the compensated budget line into the graph and mark it with "m'=.." Compute the substitution effect and mark it in the graph along the x1-axis.

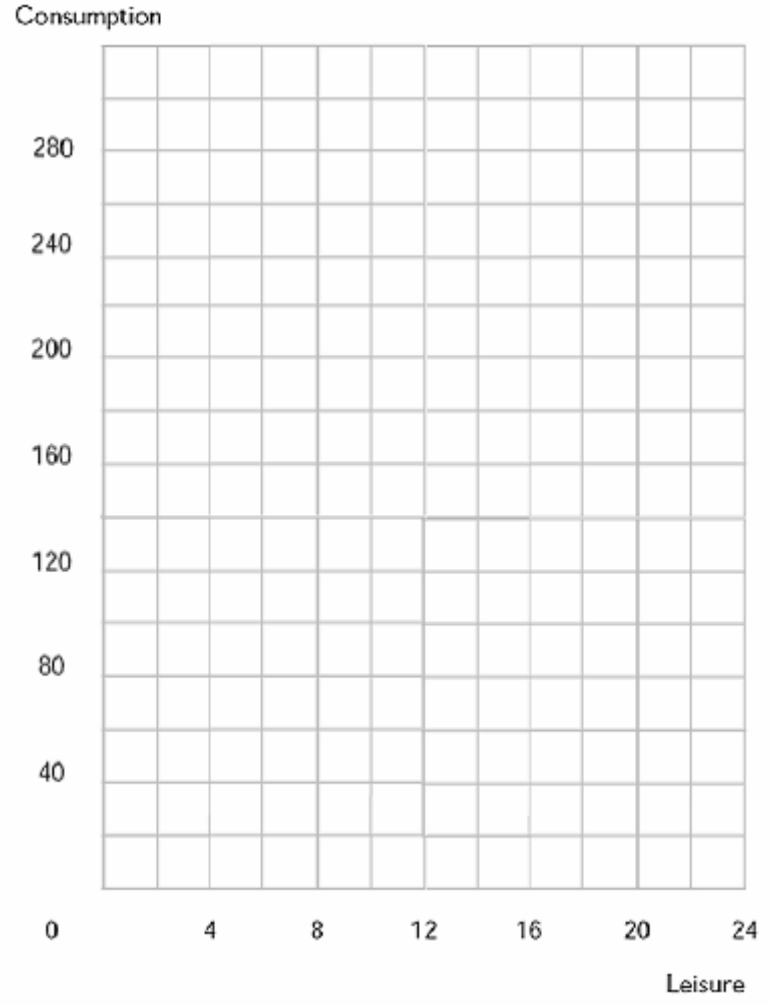
d) Compute Alice's consumption point *C* at *m* and new prices. Compute her ordinary income effect and mark it along the x1-axis. Also, draw her budget line that goes through C into the graph.

Last, compute her final consumption point *F* an mark it in the graph, together with the relative budget line. Mark this last budget line with 'm″=...' . Compute her endowment income effect and mark it along the x1-axis.

e) Finally, compute her total effect in terms of change of x1-demand from her initial to her final consumption bundle. Mark the total effect along the x1-axis. Connect Points B, C, and F with the origin (Point (0,0)). What do you observe? Explain.

*3) Bill Badwrench works in a Lebanon repair shop and can choose to work as many hours per day he wants. He has a daily nonlabor income of $ 30, and chooses to sleep 6 out of 24 hours. Bill has to make a rational decision between labor and leisure. Price for consumption is 1, and he has preferences for consumtion C and time for leisure R (hanging out with his buddies, jetskiing on Lake Mascoma) that follow the utility function of $u(x_1, x_2) = 2R^2C^5$

a) Use Lagrange method to find his optimum allocation between leisure and consumption if his boss Mr. Goodwrench pays him an hourly wage of *w=$10.*



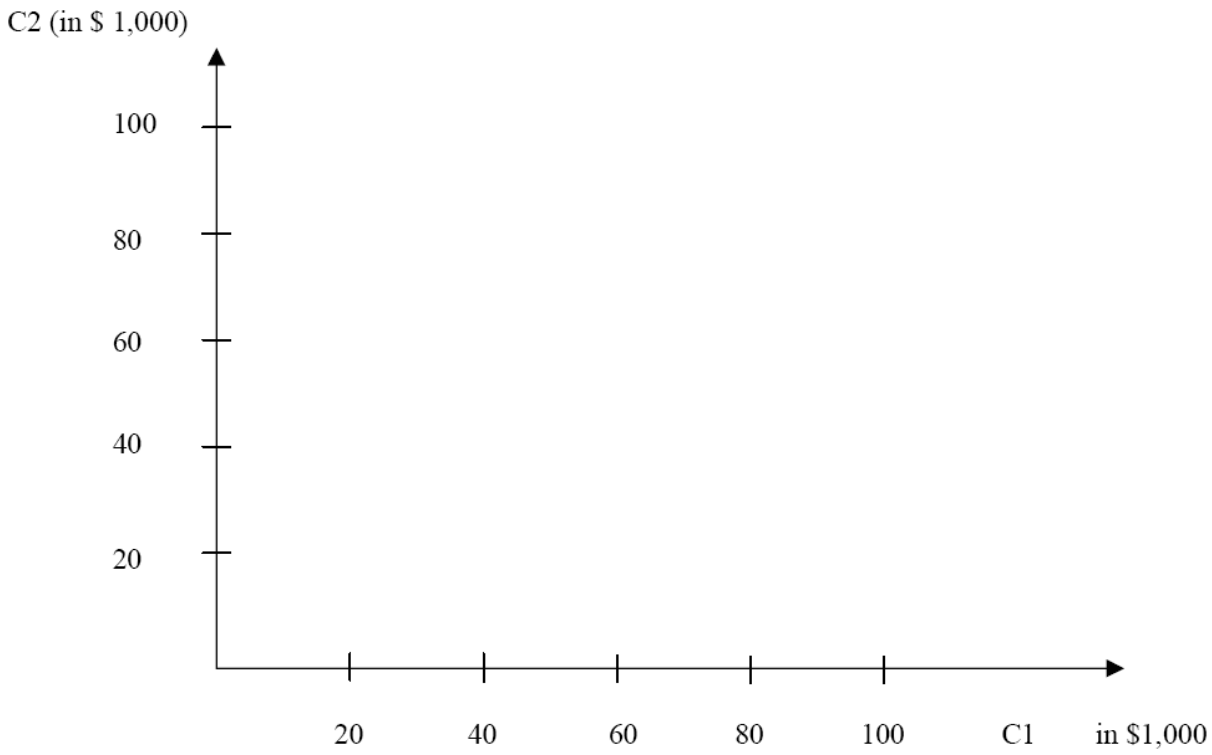
Mark his Endowment bundle, his budget line and his optimal consumption point into the graph above. How many hours does Bill work in equilibrium?

b) Write down Bill's Slutsky equation for labor and leisure and mark the signs of each term. Please use the correct notation for the variables. Can you predict without knowing the magnitude of each effect whether he will reduce or increase labor supply? Does this hold in general for all examples of Labor and Leisure? What graphical observation would support this conclusion? What part in the Slutsky equation?

c) Mr. Goodwrench knows Bill quite well and is familiar with Bill's labor-leisure decision. He doubles Bill's hourly wage to $20 for any additional hour he would work beyond his equilibrium choice of hours worked in (a), as an of overtime wage. Draw the new budget line (or the new part to it) into the graph. Find his new consumption bundle mathematically and mark the new point in the graph. Does Bill reduce or increase labor supply? Why or why not? Which is the only effect that determines his choice? Explain.

*4) William Pritchard is a banker. He earns $30,000 this year and $40,000 next year. His preference for timed consumption are U(C1,*C2*)=4$C1^3C2^3$, where C1 denotes consumption this year and C2 next year.

a) Assume there exists a credit market but that the interest rate is zero. By using the Lagrangian or by any other approach that involves the tangency condition find William's optimal consumption bundle. Graph his budget line, his allocation and his endowment point into the graph below. Label the axes. Label all the lines and points.



b) Now assume an interest rate with r=12%. Add the new budget line into the graph above. Marke the value of the slope of the budget line. Compute the numeric value of the two intercepts and mark them.

c) Write C2 as a function of his savings in period 1 (if he is a net borrower, his negative savings), corrected by prices according to the interest rate, and of his m2 value.

d) Write down William's Slutsky equation for timed consumption in its correct notation, explain the sign of each part.

Can you predict, knowing his original bundles A and E from part a) that he well increase or decrease present consumption? Explain.

5) Solve the workbook questions * # 9.7, *#9.8, *#10.7