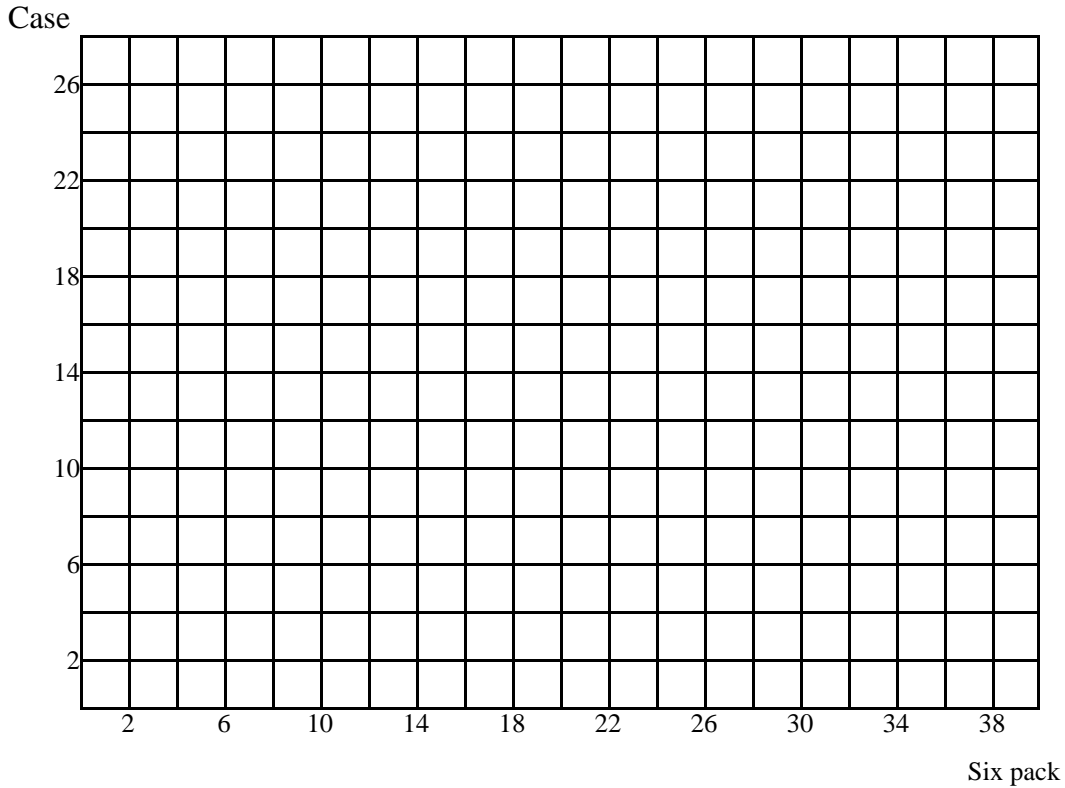


Problem Set 3
Due October 1 before 5 pm

Ch. 5 Choice and Ch. 6 Demand

Problem 1: Mary J. only cares about the amount of Pepsi that she drinks. Pepsi either comes in a six pack (x_6) or in a case (x_{24}). A case has 24 cans of soda.

a) Draw Mary J's budget line when her soda budget is \$30 and the price of a case is (p_{24}) is \$3 and the price of a six pack (p_6) is \$1



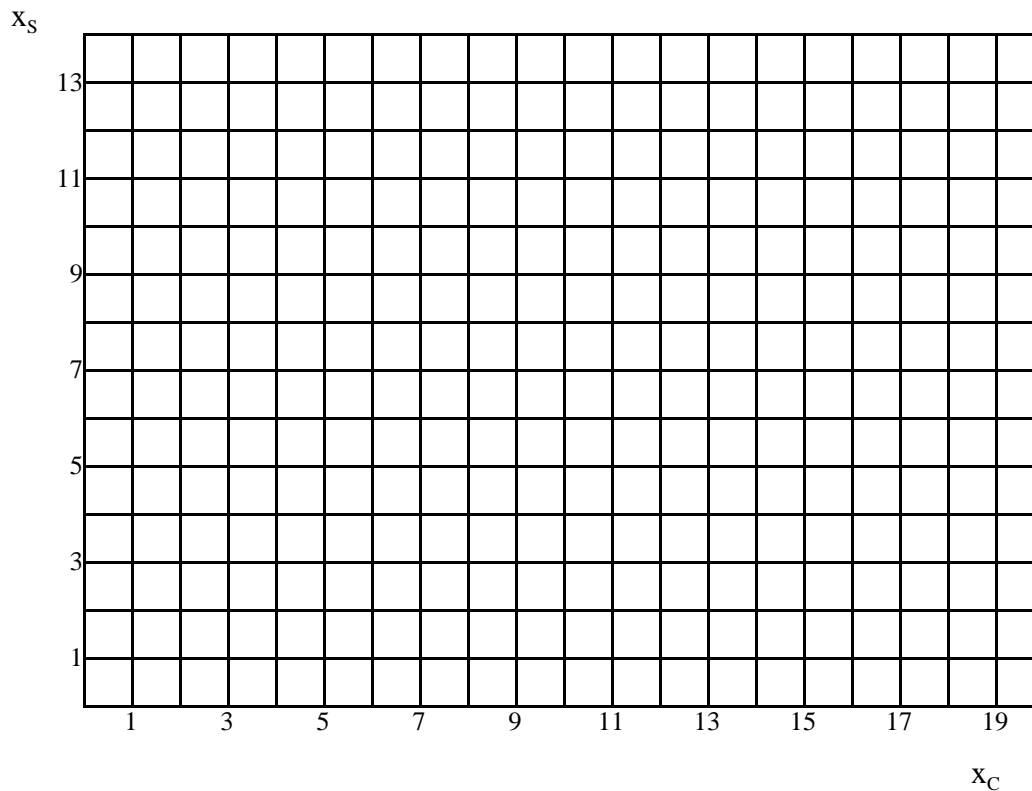
b) How many six packs and cases does Mary J buy when $m=30$, $p_{24}=3$, and $p_6=1$?

c) Draw a picture of her indifference curve through her utility maximizing bundle.

d) Find Mary J's demand function for six pack's (x_6)

Problem 2: Phoebe likes spending time at Central Perk. While at Central Perk she always wants two scones (x_S) for every one cup of coffee (x_C).

a) Draw Phoebe's budget line when her Central Perk budget is \$20, and the price of a scone is \$1 and the price of a cup of coffee is \$2



b) How many scones and cups of coffee does she buy when $m=20$, $p_S=1$, and $p_C=2$?

c) Draw a picture of the indifference curve where she maximizes utility.

d) Find Phoebe's demand function for scones (x_s) (be sure to show your work)

e) Does Phoebe view scones as a Normal or Inferior good? (Explain)

f) Are scones a luxury or a necessity or are preferences homothetic? (Explain)

g) Are scones an ordinary or Giffen good? (Explain)

f) Looking at your demand function is the cross price effect positive or negative? What does that tell you about scones and coffee? (Explain - you do not have to take the partial derivative)

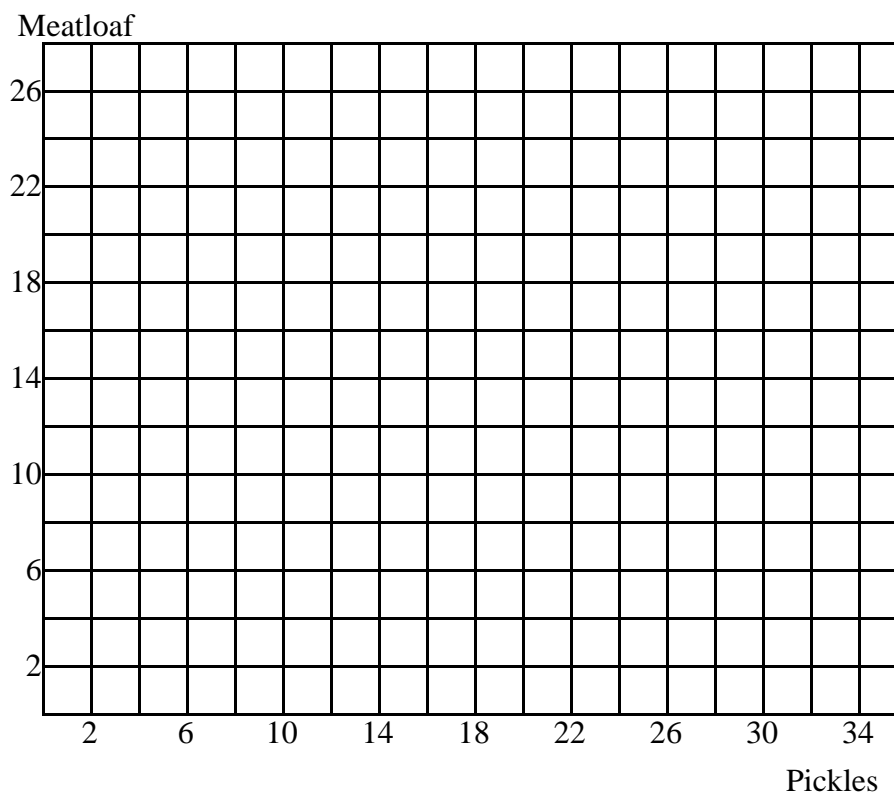
Problem 3: Julie's preferences for pickles (x_P) and meatloaf (x_M) can be captured by the following Cobb-Douglas utility function: $U = x_P \cdot x_M^2$

a) What is Julie's marginal utility of pickles and meatloaf?

b) Explain in words what the marginal utility of pickles measures

c) Determine her MRS_{x_P, x_M} for an arbitrary bundle (x_P, x_M) .

d) Draw her budget line when her budget for pickles and meatloaf is \$24 and the price of a slice of meatloaf is \$2 and the price of a pickle is \$1.



e) What is the slope of the budget line?

f) How many slices of meatloaf and how many pickles does she buy when $m=24$, $p_M=2$, and $p_P=1$? Be sure to derive the demand step by step.

g) Derive her demand function for arbitrary prices (p_P, p_M) and income m (be sure to do it step by step).

h) Given you demand function find the income elasticity of demand?

i) Given you demand function find the price elasticity of demand?

Problem 4: Suppose we observe an individual's consumption of x and y over three periods. In all periods his income is \$100, in the first period $p_x = 1$ and $p_y = 1$, in the second period $p_x = 2$ and $p_y = 1$, and in the third period $p_x = 1$ and $p_y = 2$. In the first period he consumes $(x, y) = (50, 50)$, in the second period he consumes $(x, y) = (33, 33)$, and in the third period $(x, y) = (33, 33)$. What do you think his utility function might look like?

Problem 5: Suppose we observe an individual's consumption of x and y over three periods. In all periods his income is \$100, in the first period $p_x = 1$ and $p_y = 1$, in the second period $p_x = 2$ and $p_y = 1$, and in the third period $p_x = 1$ and $p_y = 2$. In the first period he consumes $(x, y) = (100, 0)$, in the second period he consumes $(x, y) = (40, 20)$, and in the third period $(x, y) = (100, 0)$. What do you think his utility function might look like?

Problem 6: Suppose we observe an individual's consumption of x and y over three periods. In all periods his income is \$100, in the first period $p_x = 1$ and $p_y = 1$, in the second period $p_x = 2$ and $p_y = 1$, and in the third period $p_x = 1$ and $p_y = 2$. In the first period he consumes $(x, y) = (60, 40)$, in the second period he consumes $(x, y) = (30, 40)$, and in the third period $(x, y) = (60, 20)$. What do you think his utility function might look like?