Chapter 1 NAME_____

The Market

Introduction. The problems in this chapter examine some variations on the apartment market described in the text. In most of the problems we work with the true demand curve constructed from the reservation prices of the consumers rather than the "smoothed" demand curve that we used in the text.

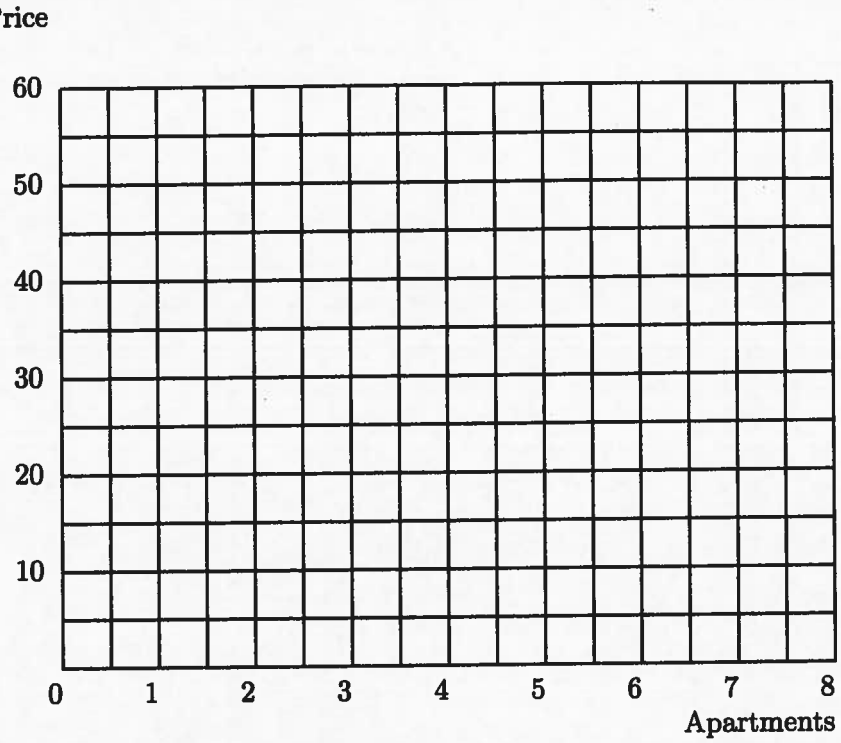
Remember that the reservation price of a consumer is that price where he is just indifferent between renting or not renting the apartment. At any price below the reservation price the consumer will demand one apartment, at any price above the reservation price the consumer will demand zero apartments, and exactly at the reservation price the consumer will be indifferent between having zero or one apartment.

You should also observe that when demand curves have the "staircase" shape used here, there will typically be a *range* of prices where supply equals demand. Thus we will ask for the the highest and lowest price in the range.

1.1 (3) Suppose that we have 8 people who want to rent an apartment. Their reservation prices are given below. (To keep the numbers small, think of these numbers as being daily rent payments.)

Person	=	A	B	C	D	E	F	G	H
Price	=	40	25	30	35	10	18	15	5

(a) Plot the market demand curve in the following graph. (Hint: When the market price is equal to some consumer i's reservation price, there will be two different quantities of apartments demanded, since consumer i will be indifferent between having or not having an apartment.)



(b) Suppose the supply of apartments is fixed at 5 units. In this case there is a whole range of prices that will be equilibrium prices. What is the highest price that would make the demand for apartments equal to 5 units?_____.

(c) What is the lowest price that would make the market demand equal to 5 units?_____.

(d) With a supply of 4 apartments, which of the people A–H end up getting apartments?_____.

(e) What if the supply of apartments increases to 6 units. What is the range of equilibrium prices?_____.

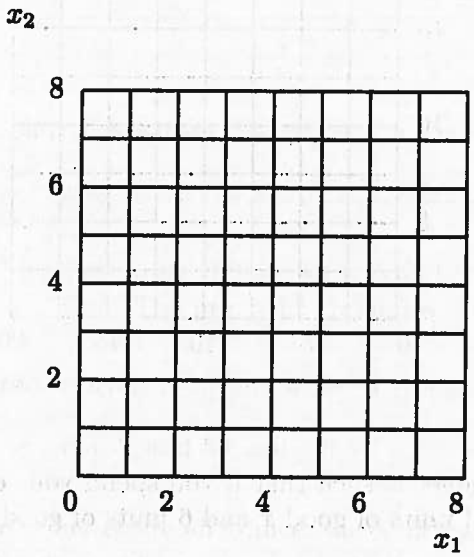
1.2 (3) Suppose that there are originally 5 units in the market and that 1 of them is turned into a condominium.

2.1 (0) You have an income of \$40 to spend on two commodities. Commodity 1 costs \$10 per unit, and commodity 2 costs \$5 per unit.

(a) Write down your budget equation._____.

(b) If you spent all your income on commodity 1, how much could you buy?_____.

(c) If you spent all of your income on commodity 2, how much could you buy?_____ Use blue ink to draw your budget line in the graph below.



(d) Suppose that the price of commodity 1 falls to \$5 while everything else stays the same. Write down your new budget equation. _____ _____ On the graph above, use red ink to draw your new budget line.

(e) Suppose that the amount you are allowed to spend falls to \$30, while the prices of both commodities remain at \$5. Write down your budget equation. _____ Use black ink to draw this budget line.

(f) On your diagram, use blue ink to shade in the area representing commodity bundles that you can afford with the budget in Part (e) but could not afford to buy with the budget in Part (a). Use black ink or pencil to shade in the area representing commodity bundles that you could afford with the budget in Part (a) but cannot afford with the budget in Part (e).

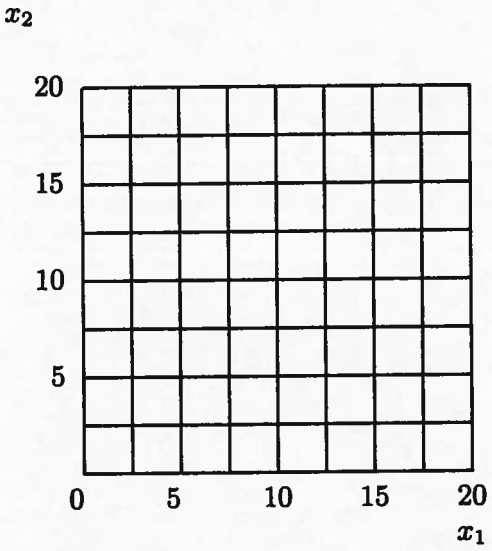
2.2 (0) On the graph below, draw a budget line for each case.

(a) $p_1 = 1$, $p_2 = 1$, $m = 15$. (Use blue ink.)

(b) $p_1 = 1$, $p_2 = 2$, $m = 20$. (Use red ink.)

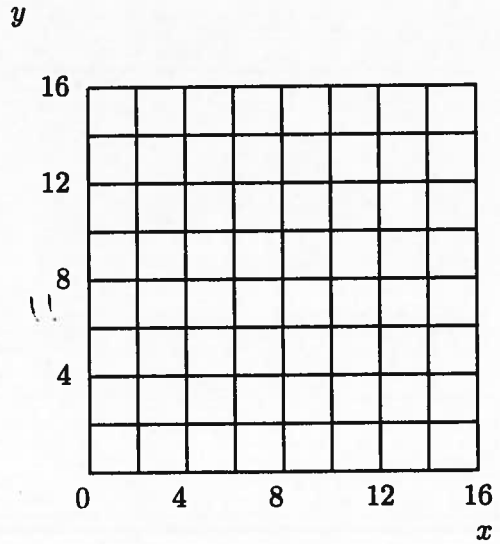
(c) $p_1 = 0$, $p_2 = 1$, $m = 10$. (Use black ink.)

(d) $p_1 = p_2$, $m = 15p_1$. (Use pencil or black ink. Hint: How much of good 1 could you afford if you spend your entire budget on good 1?)



2.3 (0) Your budget is such that if you spend your entire income, you can afford either 4 units of good x and 6 units of good y or 12 units of x and 2 units of y.

(a) Mark these two consumption bundles and draw the budget line in the graph below.



(b) What is the ratio of the price of x to the price of y?_____.

(c) If you spent all of your income on x, how much x could you buy?

_____.

(d) If you spent all of your income on y, how much y could you buy?

_____.

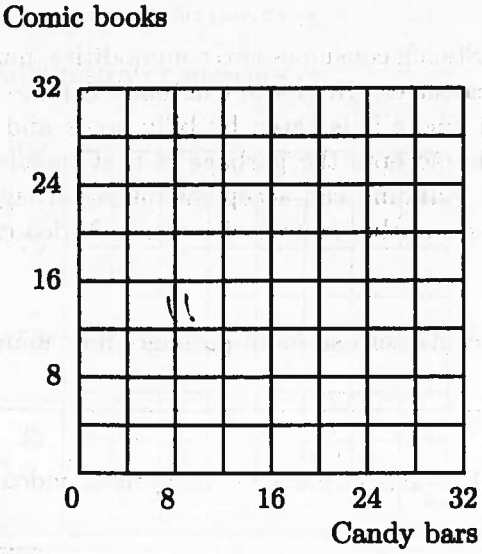
(e) Write a budget equation that gives you this budget line, where the price of x is 1._____.

(f) Write another budget equation that gives you the same budget line, but where the price of x is 3._____.

2.4 (1) Murphy was consuming 100 units of X and 50 units of Y. The price of X rose from 2 to 3. The price of Y remained at 4.

(a) How much would Murphy's income have to rise so that he can still exactly afford 100 units of X and 50 units of Y?_____.

2.5 (1) If Amy spent her entire allowance, she could afford 8 candy bars and 8 comic books a week. She could also just afford 10 candy bars and 4 comic books a week. The price of a candy bar is 50 cents. Draw her budget line in the box below. What is Amy's weekly allowance?_____.



(a) Write down a budget equation stating those combinations of the three commodities, Good X, hours of speeches by politicians (P), and hours of speeches by university administrators (A) that Emmett could afford to consume per week._____.

(b) On the graph above, draw a two-dimensional diagram showing the locus of consumptions of the two kinds of speeches that would be possible for Emmett if he consumed 10 units of Good X per week.

2.9 (0) Jonathan Livingstone Yuppie is a prosperous lawyer. He has, in his own words, "outgrown those confining two-commodity limits." Jonathan consumes three goods, unblended Scotch whiskey, designer tennis shoes, and meals in French gourmet restaurants. The price of Jonathan's brand of whiskey is \$20 per bottle, the price of designer tennis shoes is \$80 per pair, and the price of gourmet restaurant meals is \$50 per meal. After he has paid his taxes and alimony, Jonathan has \$400 a week to spend.

(a) Write down a budget equation for Jonathan, where W stands for the number of bottles of whiskey, T stands for the number of pairs of tennis shoes, and M for the number of gourmet restaurant meals that he consumes._____.

(b) Draw a three-dimensional diagram to show his budget set. Label the intersections of the budget set with each axis.

(c) Suppose that he determines that he will buy one pair of designer tennis shoes per week. What equation must be satisfied by the combinations of restaurant meals and whiskey that he could afford?_____.

2.10 (0) Martha is preparing for exams in economics and sociology. She has time to read 40 pages of economics and 30 pages of sociology. In the same amount of time she could also read 30 pages of economics and 60 pages of sociology.

(a) Assuming that the number of pages per hour that she can read of either subject does not depend on how she allocates her time, how many pages of sociology could she read if she decided to spend all of her time on sociology and none on economics? _____ (Hint: You have two points on her budget line, so you should be able to determine the entire line.)

(b) How many pages of economics could she read if she decided to spend all of her time reading economics?_____.

2.11 (1) Harry Hype has $5,000 to spend on advertising a new kind of dehydrated sushi. Market research shows that the people most likely to buy this new product are recent recipients of M.B.A. degrees and lawyers who own hot tubs. Harry is considering advertising in two publications, a boring business magazine and a trendy consumer publication for people who wish they lived in California.

Fact 1: Ads in the boring business magazine cost $500 each and ads in the consumer magazine cost $250 each.

Fact 2: Each ad in the business magazine will be read by 1,000 recent M.B.A.'s and 300 lawyers with hot tubs.

Fact 3: Each ad in the consumer publication will be read by 300 recent M.B.A.'s and 250 lawyers who own hot tubs.

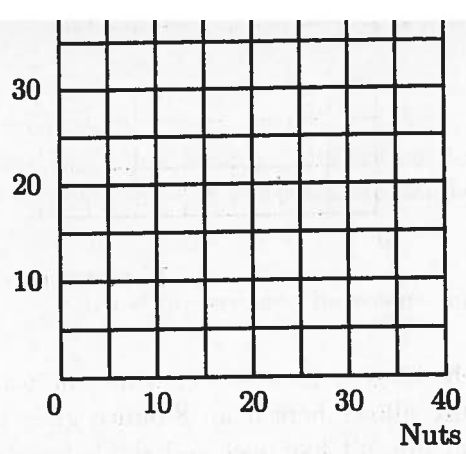
Fact 4: Nobody reads more than one ad, and nobody who reads one magazine reads the other.

(a) If Harry spends his entire advertising budget on the business publication, his ad will be read by _____ recent M.B.A.'s and by _____ lawyers with hot tubs.

(b) If he spends his entire advertising budget on the consumer publication, his ad will be read by _____ recent M.B.A.'s and by _____ lawyers with hot tubs.

(c) Suppose he spent half of his advertising budget on each publication. His ad would be read by _____ recent M.B.A.'s and by _____ lawyers with hot tubs.

(d) Draw a "budget line" showing the combinations of number of readings by recent M.B.A.'s and by lawyers with hot tubs that he can obtain if he spends his entire advertising budget. Does this line extend all the way to the axes?_____ Sketch, shade in, and label the budget set, which includes all the combinations of MBA's and lawyers he can reach if he spends *no more than* his budget.



(e) What is the slope of his indifference curve at the point $(9, 12)$?_____

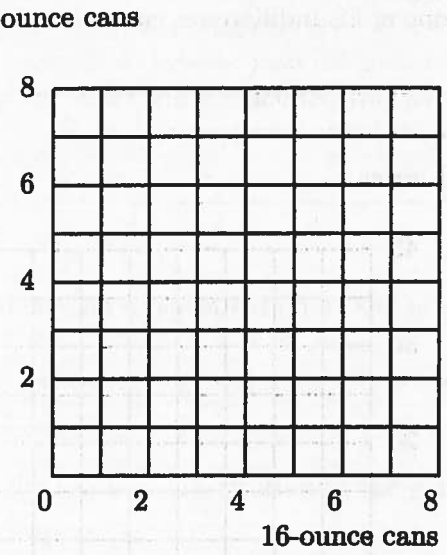
_____ at the point $(4, 16)$?_____.

(f) Do the indifference curves you have drawn for Ambrose exhibit diminishing marginal rate of substitution?_____.

(g) Does Ambrose have convex preferences?_____.

3.3 (0) Shirley Sixpack is in the habit of drinking beer each evening while watching "The Best of Bowlerama" on TV. She has a strong thumb and a big refrigerator, so she doesn't care about the size of the cans that beer comes in, she only cares about how much beer she has.

(a) On the graph below, draw some of Shirley's indifference curves between 16-ounce cans and 8-ounce cans of beer. Use blue ink to draw these indifference curves.



(b) Lorraine Quiche likes to have a beer while she watches "Masterpiece Theatre." She only allows herself an 8-ounce glass of beer at any one time. Since her cat doesn't like beer and she hates stale beer, if there is more than 8 ounces in the can she pours the excess into the sink. (She has no moral scruples about wasting beer.) On the graph above, use red ink to draw some of Lorraine's indifference curves.

3.4 (0) Elmo finds himself at a Coke machine on a hot and dusty Sunday. The Coke machine requires exact change—two quarters and a dime. No other combination of coins will make anything come out of the machine. No stores are open; no one is in sight. Elmo is so thirsty that the only thing he cares about is how many soft drinks he will be able to buy with the change in his pocket; the more he can buy, the better. While Elmo searches his pockets, your task is to draw some indifference curves that describe Elmo's preferences about what he finds.