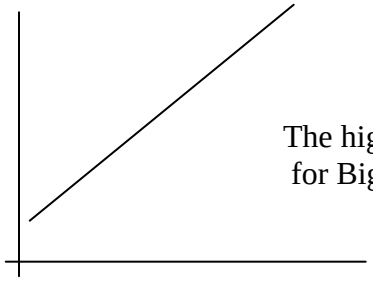
DUSP 11.203 Frank Levy
Microeconomics Session 8

Review Materials
Answers to Review Problems for the First Exam

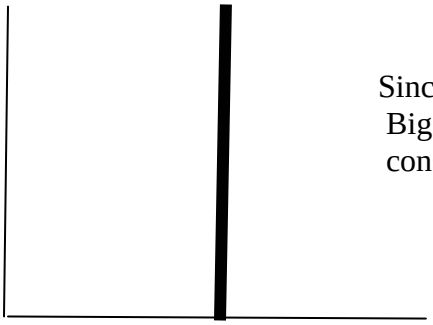
1) Answers

	Quantity Axis	Price Axis
1) First Curve to Draw	Quantity of Big Macs	Price of pizza



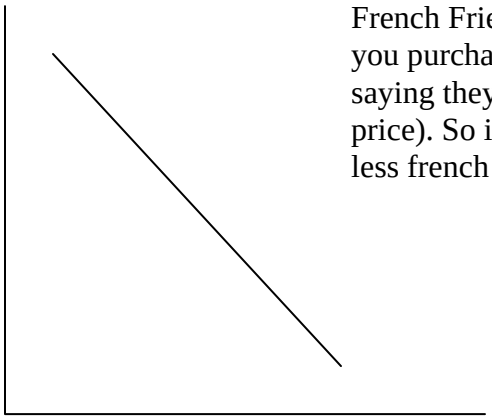
The higher the price of pizza (which substitutes for Big Macs), the larger the demand for Big Macs.

2) Second Curve to Draw	Quantity of Big Macs	Price of exterior house paint



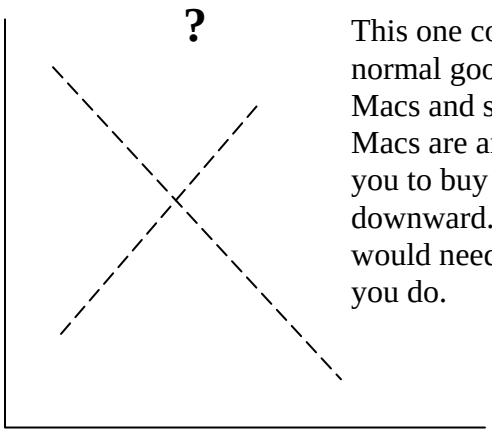
Since exterior house paint has no particular relationship to Big Macs, the quantity of Big Macs sold should remain constant whatever the price of housepaint.

3) Third Curve to Draw Quantity of Big Macs Price of French Fries



French Fries are a complement with Big Macs (i.e. you purchase them together which is the same as saying they have a negative cross-elasticity of price). So if the price of french fries rises, you buy less french fries and fewer Big Macs.

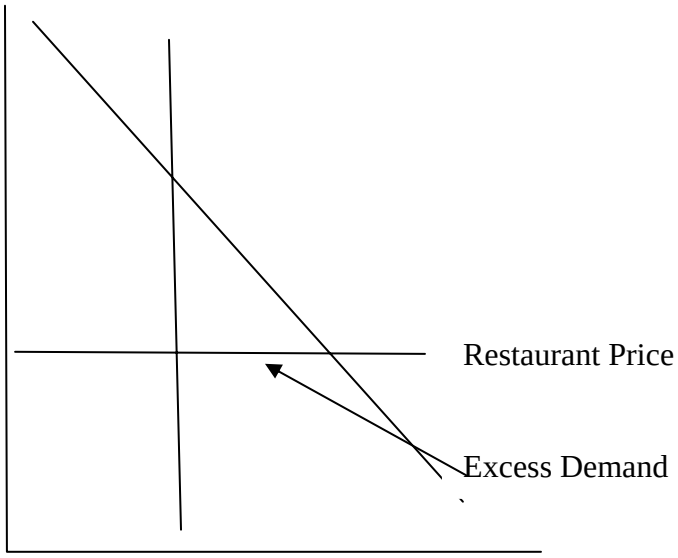
3) Fourth Curve to Draw Quantity of Big Macs Income on the Vertical Axis



This one could go either way. If Big Macs are a normal good, higher income will lead to more Big Macs and so the curve will slope upward. If Big Macs are an inferior good, higher income will cause you to buy fewer Big Macs and the curve will slope downward. While either answer is acceptable, you would need to explain why you draw the curve as you do.

2a) The basic statement makes no sense – the restaurant can't be crowded if nobody goes there.

One reasonable way to interpret the statement is that the restaurant is very popular and but hasn't let its prices rise enough to bring demand back down to the restaurant's capacity (supply). The result is a lot of excess demand (see figure) as well as many people who would like to go to the restaurant but who finally give up trying because they can never get a reservation.

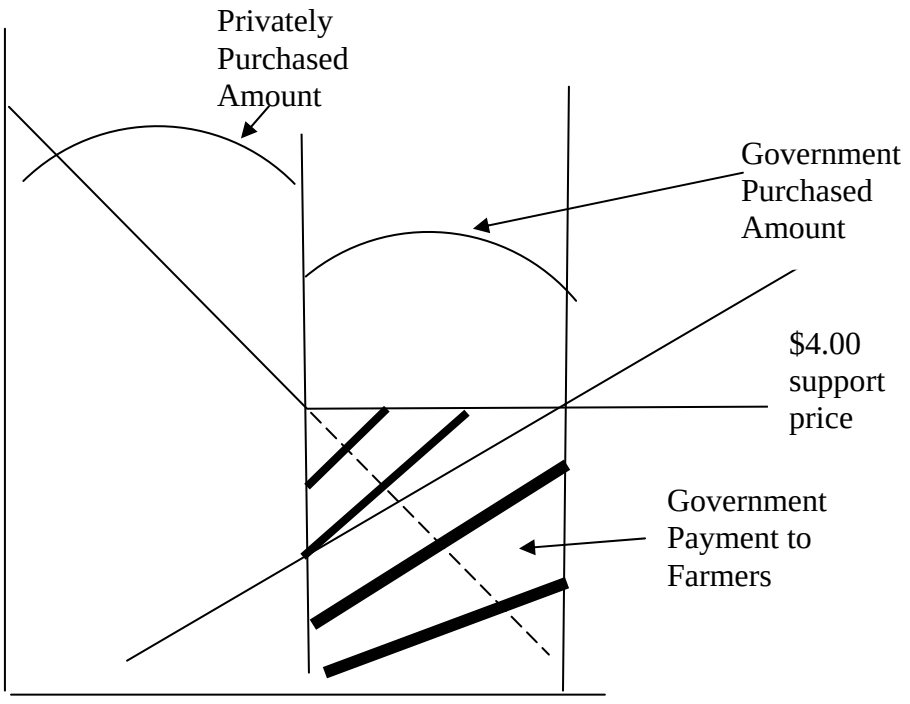


b) As noted above, the restaurant has no incentive to lower prices. This begins to get at Anna's question about why education costs so much. There are certainly ways of lowering educational costs – more lectures on DVD, teachers teaching more subjects, etc. But instituting these changes would require pressure to lower cost and in the current market, universities compete on prestige at least as much as cost - i.e. schools like MIT, Ivy League schools, find they can get numerous applications even though they charge high tuition (same logic applies to the out-of-state applications for the top ranked state schools). Since school prestige depends on faculty quality, it also means that schools compete for good faculty which means they are not able to demand huge teaching loads, etc.

c). The statement makes more sense than Yogi's quote. The growth of total output in the state requires, among other things, an increasing labor force. But if new workers can't find affordable housing, they will not come to the state. The result will less output growth. Once policy, suggested by Alan Clayton Matthews, a U-Mass Economist, begins by understanding that when people look for "housing", they are really looking for housing with good schools. Many Massachusetts towns have plenty of housing stock but are ruled out by potential buyers because of poor school quality. Improving the schools would increase the effective supply of affordable

housing.

3) A rough diagram appears below. The government plan inserts a new, perfectly elastic demand curve at $4.00 – i.e. the price no longer falls below that level and that is now the equilibrium price. The amount produced is determined where the supply curve hits $4.00 – i.e. the farmers adjust to the fact that they are getting $4.00/bu and don't care how much of it is sold to private markets, the government, etc. Total money to farmers = total output multiplied by $4.00. The government portion of that is shown in the diagram.



4) a) You might think that the demand for breakfast is most inelastic in the earlier hours and so that is when you could charge the highest prices.

b) The opportunity cost involves the limited capacity of the kitchen – in particular the grill. If cooking eggs takes up grill space that might be used for hamburgers and other lunch sandwiches and those sandwiches are more profitable than eggs, you want a pricing system in which people only order eggs if, during lunchtime, they generate as much profit as the things people order for lunch.

5) a) The answer depends on the elasticity of the demand curve at the $1.00 fare and we have

enough information to calculate this.

Elasticity = (deltaQ/Q)/(delta P/P) = deltaQ/delta P/ (P/Q)

Now fill in the numbers.

deltaQ/delta P is the is just the derivative or slope of the demand function = -1000.

We know from the problem that P = 1.00.

We can get Q by plugging $1.00 into the demand function = 4000

Putting this together: e = -1000*(1.00/4000) = -.25

The demand curve is inelastic at this point and so higher revenues come from raising, rather than lowering, the price.

6) a) Using the standard formula for elasticity:

e – (-.5bil./30bil.)/(.08/.85) = -.17 = quite inelastic

b) The elasticity of -.17 means that every one percent increase in price will decrease demand by roughly one-fifth of one percent. If the tax went to $.32 per pack, the price would have risen from $.93 per pack (the original $.85 per pack plus the $.08 tax increase in the original bill) to $1.07, a 15 percent price increase. When the demand elasticity is -.17, a 15 percent price increase translates into roughly a 2 1/2 percent decline in cigarette purchases which is not very significant.

c) In our elasticity calculation, we assumed that the additional $.08 tax in 1983 caused demand to fall from 30 billion to 29.5 billion. In other words, we were assuming that without the $.08 tax, 1984 demand would have been the same as 1983 demand. If the adult population increases by 5 percent per year, a better assumption is that increased population growth pushes out the demand curve and, other things equal, causes cigarette consumption to increase by 5 percent. This means that without the tax, 1984 consumption have been 30.6 billion and so the effect of the tax was to decrease demand by 1.1 billion. You can work through the rest of the problem from here.

7) The statement ignores the impact of diminishing marginal utility (which has everything to do with the statement). Because of diminishing marginal utility, the value to you of a second head of lettuce is likely to be less than the value of the first head of lettuce and so you may now turn to other goods. Diminishing marginal utilities also helps explain why the slope of an indifferences curve changes as we move along it. As we move along the indifference curve, acquiring, say, more lettuce and less tomatoes, the marginal utility of lettuce falls (diminishing marginal utility) and the marginal utility of tomatoes rises (also the result of diminishing

marginal utility since we have fewer tomatoes). As we have shown in class, the slope of the indifference curve is the ratio of the marginal utilities and so these simultaneous changes explain the changing slope.

7)a) Answer: $MUH = .5x6H^{-.5}$ $MUA = .5x4A^{-.5}$

b) The equation here is (MUH)/\$2.00 = (MUA)/\$.50

Specifically: $3H^{-.5}$ /\$2.00 = $2A^{-.5}$/ \$.50 or $3/(2H^{-5}) = 4/(A^{-.5})$

which, in my not always accurate math, leads to A = 7.11*H - i.e. you buy 7.11 Apples for every hamburger)

c) To answer the question, begin with the budget line equation:

\$2.00*H + \$.50*A = YYYYYY . Then, substituting the result you just derived that expresses A in terms of H in the utility maximizing solution:

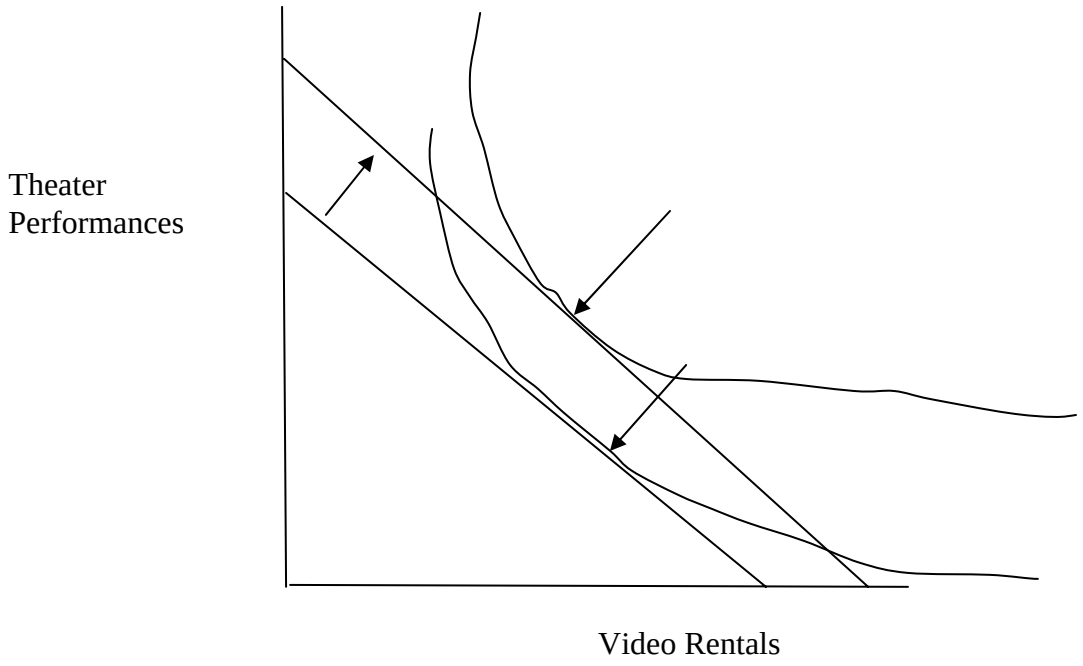
\$2.00*H + \$.50*7.11*H = YYYY

\$5.56H = YYYY

H = YYYY/\$5.56

and A = 7.11*(YYY/\$5.56) (Sorry the math came out messy on this one).

8) a) As some of you have discovered, I have never won an award for either free hand drawing or computer drawing. A sketch of the answer appears below with theater performances on the vertical axis and video rentals on the horizontal axis. As you can see, there are no tricks here – it's just that on the higher income line, the point of tangency represents more theater performances and less video rentals than the point of tangency on the lower income line.



b) When we calculate diminishing marginal utility, we are looking at the gain in utility per unit increase in, say, Theater Performances **holding all other goods constant.** In this case, we are comparing your interest in Theater Performances as your income rises. When we move from one income level to a higher one, it presumably means **your consumption of every good has changed.** In this circumstance, we have no preconception about whether marginal utility should be increasing or decreasing.

c) To get to an answer, it is useful to specify some prices. Let's assume that the price of a Video Rental is $4.00 and the price of a Theater Performance is $24.00. Using these prices, we can write:

$(MU_{VR}/\$4.00) = MU_{TP}/\$24.00)$ or $6/(4 \times \text{Video Rentals}) = 6/(24 \times \text{Theater Performances})$

Solving this equation, I get: Video Rentals = 6xTheater Performances. (but you should check my math)

In plain English, this means that in the utility maximizing solution, you will purchase six Video Rentals for every one Theater Performance you purchase.

The key here is that this condition is a constant: there is nothing in the formula that says the ratio of Video Rentals to Theater Performances should shrink as the person becomes richer. So this function cannot model the kind of shifting behavior described in the problem where higher income causes you to increase the number of Theater Performances and decrease the number of

Video Rentals.

SPECIAL BONUS PROBLEM #9 (INCLUDING ANSWER)

THE FOLLOWING QUESTION AND ANSWER WERE PROVIDED TO ME BY MY SIXTH GRADE NEPHEW THIS PAST SATURDAY.

QUESTION: WHAT IS THE DIFFERENCE BETWEEN A NEW YORK YANKEE HOT DOG AND A BOSTON RED SOX HOT DOG?

ANSWER: YOU CAN STILL BUY A NEW YORK YANKEE HOT DOG IN THE MIDDLE OF OCTOBER.