NAME ____________________ Lovell, Microeconomics
Pledge: No Aid; No Violations Economics 271
Sign ________________________ October 13, 1997

Columbus Day Quiz Post Mortem

Part I: a=4, b=2, c=7, d=5, e=6, f=14, g=9, h=1:

Part II:

a. A fee per visit of $100 will maximize the income of a physician practicing in Dogpatch. It will yield total revenue of $80,000. Since q = 1600 – 8p, revenue is $R(p) = 1600p - 8p^2$, dR/dp = q600 – 16p = 0 implies p = 100.

b. Consumer surplus is ($200-$100)x800/2 = $40,000.

c. A fee of $10 would maximize the excess of consumer surplus over the $100,000. With this fee the net value of the physician's services is consumer surplus of ($200-$10)1620/2 + $10x1620, while the costs are $10x1620 + $100,000, leaving a net gain of $53,900

Part III

a. If Richard's wealth were $100,000, he would enjoy $(100{,}000/1000)^{1/2} = 100^{1/2} = 10$ utiles of satisfaction

b. The numbers on the table reveal that if he doesn't buy the insurance, the expected value of Richard's wealth is 109,000 and his expected utility is 10.41. If he buys the insurance, Richard will have $108,500 with certainty and he will enjoy 10.42 utiles of satisfaction. It is rational for Richard to buy the insurance because his expected utility is less if he doesn't purchase it..

c. Tom's marginal utility of wealth is 1/1000. His utility function does not satisfy the Law of Diminishing Marginal Utility. Tom is risk neutral. His expected utility is higher if he doesn't buy the insurance.

HONORS OPTION: To find a point on the contract curve (an efficient allocation) you can maximize the utility of Mortimer subject to three constraints: you must keep Norton on a particular indifference curve (e.g. keep U_n at level U_n*) and you must satisfy two resource constraints ($X_m + X_n = 15$ and $Y_m + Y_n = 10$). The Lagrangian expression is

$$L(X_m,X_n,Y_m,Y_n) = U_m(X_m,Y_m) + \lambda_1(U_n(X_n,Y_n) - U^*) + \lambda_2(X_m + X_n - 15) + \lambda_3(Y_m + Y_n - 10).$$

WN, p 237, equation 8.3 shows a slightly different but equivalent way to set up the Lagrangian expression.

To get the set of all efficient points constituting the contract curve we vary U_n^* over all feasible values.

Alternatively, note that U_m is homothetic, which means that the marginal rate of substitution is the same for all points in the Edgeworth box where $Y_m/X_m = 10/15$; furthermore, U_n is a monotonic transformation of U_m; hence Norton's marginal rate of substitution is the same as Mortimer's if $Y_n/X_n = 10/15$. Now everywhere along the line in the Edgeworth box connecting the southwest with the northeast corner these ratios are attained; hence along this line their indifference curves are tangent, so that must be the contract curve. Because of the convexity of the indifference curves, no other points are efficient.

The average score was 84 and the range was 50 to 92. *Please* make a point of seeing me early next week if your score was below 75.