Problem Set 2

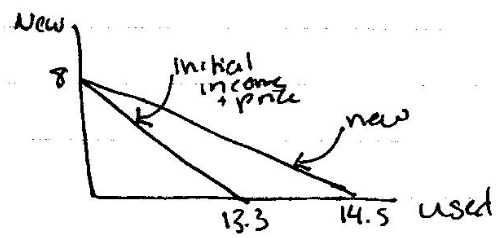
Answer Key

Part 1 - Chapter 4

5) a) sub effect causes her to buy more clothing convexity of indifference curves ~~also~~ means sub. effect will ~~be~~ be positive for price decrease

b) income effect could be positive or negative, depending on whether clothing is an inferior good.

10) He won't be worse off. Income increase covers price increase, which is a corner solution. But, any combination of >1 used books leaves him with leftover income, and thus better off.



22) Partial Derivative:

a) $\frac{\partial U}{\partial D} = -0.5(50-D)^{-0.5} A^{0.5}$

this is negative, so D is an economic bad.

b) Budget Constraint:

$Y - 60 - (P_c - 2.50)D - A$

c) Laris Legrangian:

$L = (50-D)^{0.5} A^{0.5} + \lambda(Y - 60 - (P_c - 2.5)D - A)$

First Order Conditions:

$$\frac{\partial L}{\partial D} = -0.5(50-D)^{-0.5}A^{0.5} - (P_c - 2.5)\lambda$$

$$\frac{\partial L}{\partial A} = 0.5(50-D)^{0.5}A^{0.5} - \lambda$$

$$\frac{\partial L}{\partial \lambda} = Y - 60 - (P_c - 2.5)D - A$$

$\frac{\partial L}{\partial D} \Big/ \frac{\partial L}{\partial A}$, solve for A: $A = (2.5 - P_c)(50 - D)$

Sub into ~~3rd~~ $\frac{\partial L}{\partial \lambda}$ and solve for D:

$$D = \frac{Y - 185 + 50P_c}{2P_c - 5}$$

Sub in A

$$A = 32.5 + 0.5Y - 2.5P_c$$

d) Partial of optimal D value: (Price)

$$\frac{\partial D}{\partial P_c} = \frac{120 - 2Y}{(2P_c - 5)^2}$$ which is negative

e) (income)

$$\frac{\partial D}{\partial Y} = \frac{1}{2P_c - 5}$$ which is negative

30) Tangency Condition: $\frac{P_1}{P_2} = \frac{q_2^{1-\rho}}{q_1^{1-\rho}}$

implies:

$$P_2 q_2 = q_1 \left[\frac{P_1}{P_2}\right]^{\frac{1}{1-\rho}}$$

sub into budget constraint.

$$y = p_1 q_1 + q_1 \left[\frac{p_1}{p_2}\right]^{\frac{1}{1-\rho}} = q_1\left(p_1 + \left[\frac{p_1}{p_2}\right]^{\frac{1}{1-\rho}}\right)$$

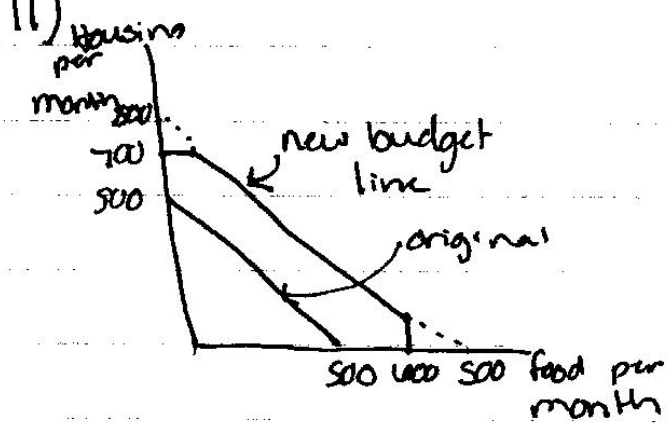
31) $Y = q_1\left(p_1 + \left[\frac{p_1}{p_2}\right]^{\frac{1}{1-\rho}}\right)$

so $q_1 = y\left(p_1 + \left[\frac{p_1}{p_2}\right]^{\frac{1}{1-\rho}}\right)^{-1}$

and: $q_2 = y\left(p_2 + \left[\frac{p_2}{p_1}\right]^{\frac{1}{1-\rho}}\right)^{-1}$

– Chapter 5

11)



38) Price of $20{,}000^{th}$ bid:

$p = 1{,}000 - 0.4Q \qquad p = 1000 - 0.4\,2(20{,}000)$

$p = 200$

Demand: $25{,}000 - 25p$

supplus is area under curve between 1000 and :

$$CS = \int_{200}^{1000} (25{,}000 - 25p)\,dp \qquad CS = \left(25{,}000p - \frac{25}{2}p^2\right)\Big|_{200}^{1600}$$

At \$100, consumers get surplus above, plus the 20,000 consumers who get tickets will have surplus equal to difference in the \$200 and \$100 prices:

$CS: 8,000,000 + 20,000(200-100)$

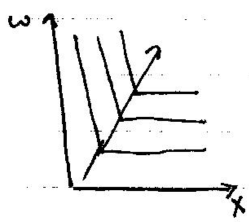
$= 8,000,000 + 2,000,000$

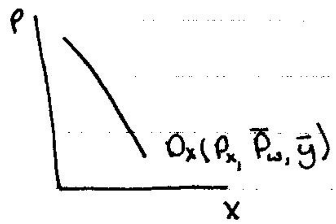
$CS = \$10,000,000$

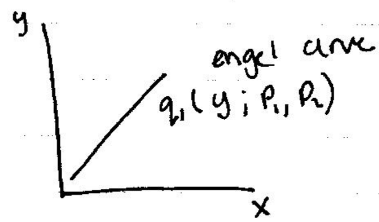
CS with the 100\$ price is larger

Part 2

1)







I looked at a variety of answers

2) Income effects negligible for goods with perfectly inelastic demands, since quantity demanded never changes.

Income effect can be as important as sub. effect in many cases.

3) Useful:

examining goods in a consumer bundle

or any other correct answer

Misleading:

assumes consumers look at only 2 goods