Practice Problems from Chapter 4 and Chapter 5 also homework 1 and 2 and inclass problems from Chapter 3 and 4

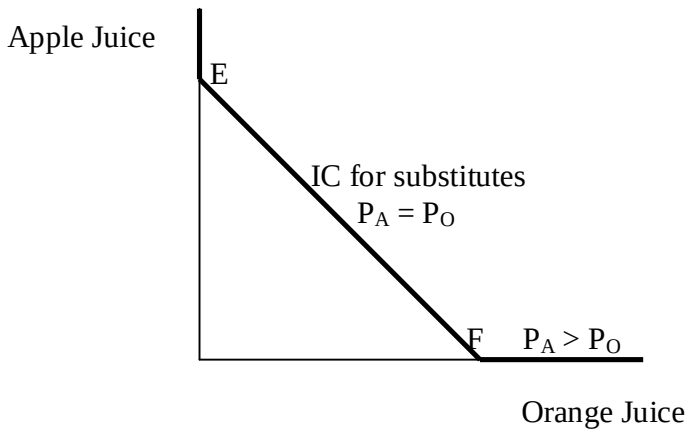
1. Exercises page 142 number 1

The PCC connects each of the four optimal bundles given in the table above. As the price if wine increases, the budget line will pivot inwards and the optimal bundle will change. (too hard to show on the computer, I tried but it didn't work in WORD.)

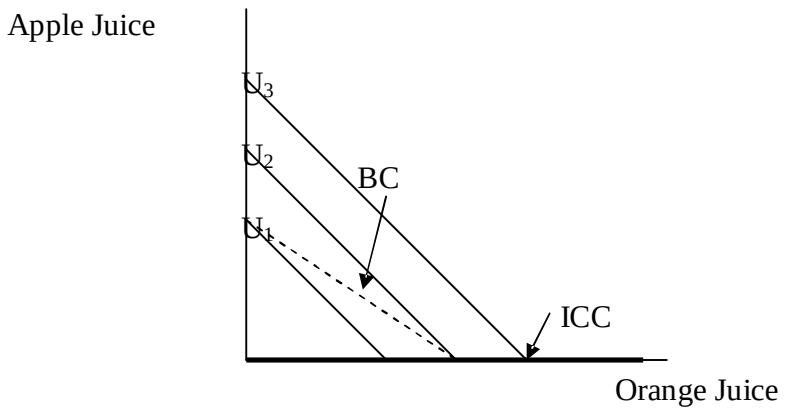
2. Exercises page 142 number 4

a) We know that the indifference curves for perfect substitutes will be straight lines. In this case, the consumer will always purchase the cheaper of the two goods. If the price of OJ is cheaper than the price of apple juice, the consumer will purchase only OJ and the PCC will be on the "orange juice axis" (point F). If apple juice is cheaper than OJ, the consumer will purchase only apple juice and the PCC will be on the "apple juice axis" (point E). If the prices are the same, the consumer is indifferent between the two; the PCC will coincide with the indifference curve (between E and F).

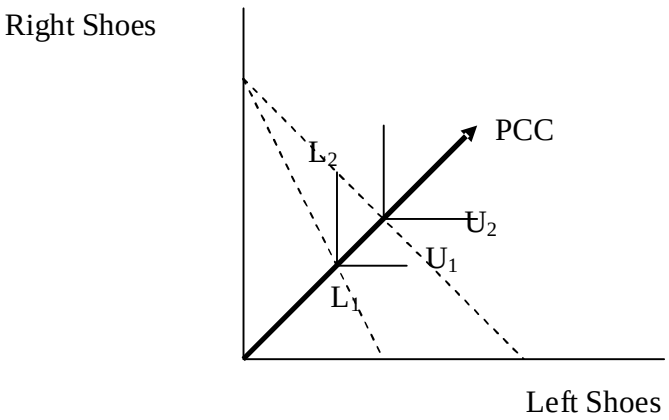
$P_A < P_O$



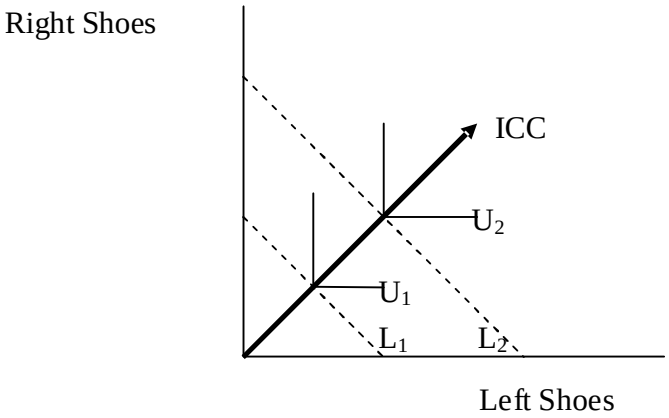
Assuming that the price of OJ is less than the price of Apple Juice, the consumer will maximize her utility by consuming only OJ. As the level of income varies, only the amount of OJ varies. Thus, the income consumption curve will be the "orange juice axis."



b) For goods that are perfect complements, such as right and left shoes, we know that the indifference curves are L-shaped. The point of utility maximization occurs when the budget constraints, L_1 and L_2 touch the kink of U_1 and U_2.



In the case of perfect complements, the ICC is also a line through the center corners of the L-shaped IC.



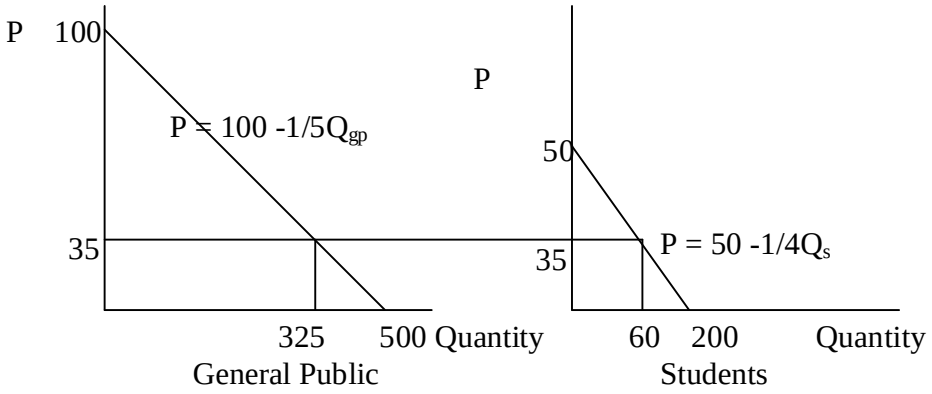
3. Exercises page 143 number 6

It is important to remember that less leisure implies more hours spent working at the higher wage. Sam s leisure demand curve is downward sloping. As the price of leisure (the wage) rises, he chooses to consume less leisure to spend more time working at a higher wage to buy more goods. Barb s leisure demand curve is upward sloping. As the price of leisure (the wage) rises, she chooses to consume more leisure since her working hours are generating more income. This difference in demand can be explained by examining the income and substitution effects for the two individuals. The substitution effect measures the effect of the change in the price of leisure, keeping utility constant (the budget line will rotate around the current IC). Since the substitution effect is always negative (with a price RISE), a rise in the price of leisure will cause both individuals to consume less leisure. The income effect measures the change in purchasing power caused by the change in the price of leisure. Here, when the price of leisure (the wage) rises, there is an increase in purchasing power (the new budget line shifts outward). Assuming both individuals consumer leisure to be a normal good (not a necessary assumption for Sam), then the increase in purchasing power will increase the demand for leisure. For Sam, the reduction in

leisure demand caused by the substitution effect outweighs the increase in demand for leisure caused by the income effect. For Barb, her income effect is larger than her substitution effect.

4. Exercises page 143 number 7

a)



Q_{gp} = 500 ~~5~~(35) = 325 tickets; Q_s = 200 ~~4~~(35) = 60 tickets

b) The elasticity of demand for each group at the current price and quantity is given by:

$$\text{Elasticity}_{gp} = \frac{-5(35)}{325} = -0.54;\ \text{Elasticity}_{s} = \frac{-4(35)}{60} = -2.33$$

If the price of tickets increases by one percent then the general public will demand .54% fewer tickets and the students will demand 2.33 fewer tickets.

c) No he is not maximizing revenue since neither one of the calculated elasticities is equal to -1. Since demand by the general public is inelastic at $35, the director could increase the price and quantity demanded would fall by a smaller amount in percentage terms, causing revenues to increase. Since demand by the students is elastic $35, the director could decrease the price and quantity demanded would increase by a larger amount in percentage terms, causing revenues to increase.

d) To figure this out, for the general public:

$$\frac{-5(P)}{Q} = -1 \text{ à } \begin{array}{l} 5P = Q = 500 - 5P \\ P = 50; Q = 250 \end{array}$$; for the students:

$$\frac{-4(P)}{Q} = -1 \quad \begin{array}{l} 4P = Q = 200 - 4P \\ P = 25; Q = 100 \end{array}$$

5. Exercises page 184 number 1

a) EV = (0.2)*($125) + (0.3)*($100) + (0.5)*($50)=$80

b) Variance is sum of squared deviations from the mean, $80, weighted by their probabilities = $(0.2)*(125-80)^2 + (0.3)*(100-80)^2 + (50-80)^2$ = $975

c) A risk-neutral person would pay the expected value of the lottery = $80

6. Exercises page 184 number 3.

a) EV = (0.5)*(0) + (0.25)*($1) + (0.2)*($2) + (0.05)*($7.5)=$1.025

Variance = $(0.5)*(0-1.025)^2 + (0.25)*(\$1-1.025)^2 + (0.2)*(\$2-1.025)^2 + (0.05)*(\$7.5-1.025)^2$=$2.812

b) An extremely risk-averse individual will probably not buy the ticket, even though the expected value (1.025) is great than the price (1). The difference in the expected return is not enough to compensate Richard for the risk. Assume is income is given by $10 (your number could be different which makes it too hard for you to solve this problem):

$EU_{no\ gamble} = (10)^{1/2} = 3.16$

and with risk (it will be Income + winnings ticket price of $1)

$EU_{gamble} = (0.5)*(\$10+0-1)^{1/.2} + (0.25)*(\$10+1-1)^{1/2} + (0.2)*(\$10+2-1)^{1/2} + (0.05)*(\$10+7.5-1)^{1/2}$

$= 1.5 + 0.79 + 0.66 + 0.20 = 3.15$

c) Okay, so without initial income this question cannot be correctly calculated, sorry.

7. Exercises page 184 number 6

a) Natasha is risk averse.

b) $U_{currentjob}=(10*40)^{1/2} = 20$ (recall I = 40);

$EU_{newjob/gamble}=(0.6)*(10*44)^{1/2}+(0.4)*(10*33)^{1/2}=12.59+7.27=19.86$ Therefore, she should NOT take the new job (the utility she receives at her current job is higher than the EU of the new job).

c) $EU_{newjob/gamble}=19.86 = EU_{insurance}=(10*(40-x))^{1/2}$;

solving for x à 394.42=10(40-x) à 39.44=40-x;

so x =.56 (or approximately $560).