

1.

$$U = X^{.3} Y^{.7}$$

$$X^* = .3 I / P_X$$

$$Y^* = .7 I / P_Y$$

$$E_{X, P_X} = \frac{dX}{dP_X} \cdot \frac{P_X}{X} = -.3 I P_X^{-2} P_X / (.3 I / P_X) = -1$$

$$E_{X, I} = \frac{dX}{dI} \cdot \frac{I}{X} = .3 P_X^{-1} \cdot I / (.3 I / P_X) = 1$$

$$E_{X, P_Y} = \frac{dX}{dP_Y} \cdot \frac{P_Y}{X} = 0$$

• Homogeneity: $E_{X, P_X} + E_{X, P_Y} + E_{X, I} = 0$
 $-1 + 0 + 1 = 0$ ✓

• Engel aggregation: $S_X E_{X, I} + S_Y E_{Y, I} = 1$

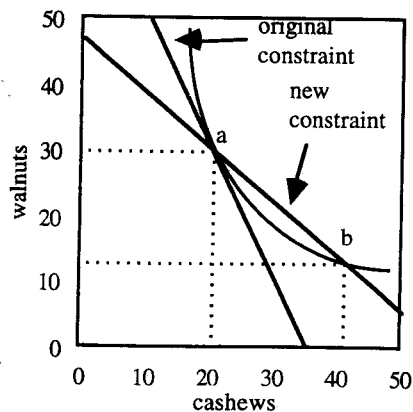
$$X^* = .3 I / P_X \Rightarrow S_X = .3, \quad S_Y = .7$$

$$.3 \cdot 1 + .7 \cdot 1 = 1$$
 ✓

• Cournot aggregation $\Rightarrow S_X E_{X, P_X} + S_Y E_{Y, P_X} = -S_X$
 $.3(-1) + (.7)(0) = -.3$ ✓

2.

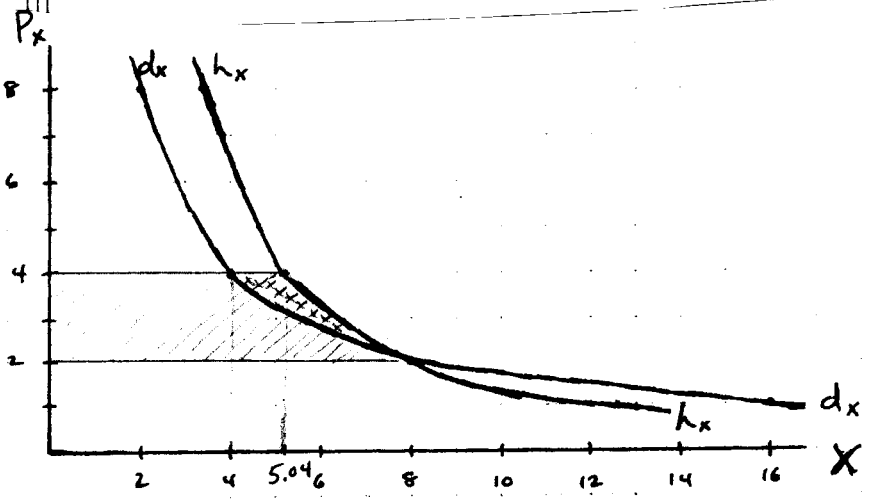
Hilary's new budget line passes through her original consumption bundle. She can reach a higher indifference curve by substituting towards the now relatively cheaper cashews.



3.

See Question #2, Test #1 KEY, Fall 2003.

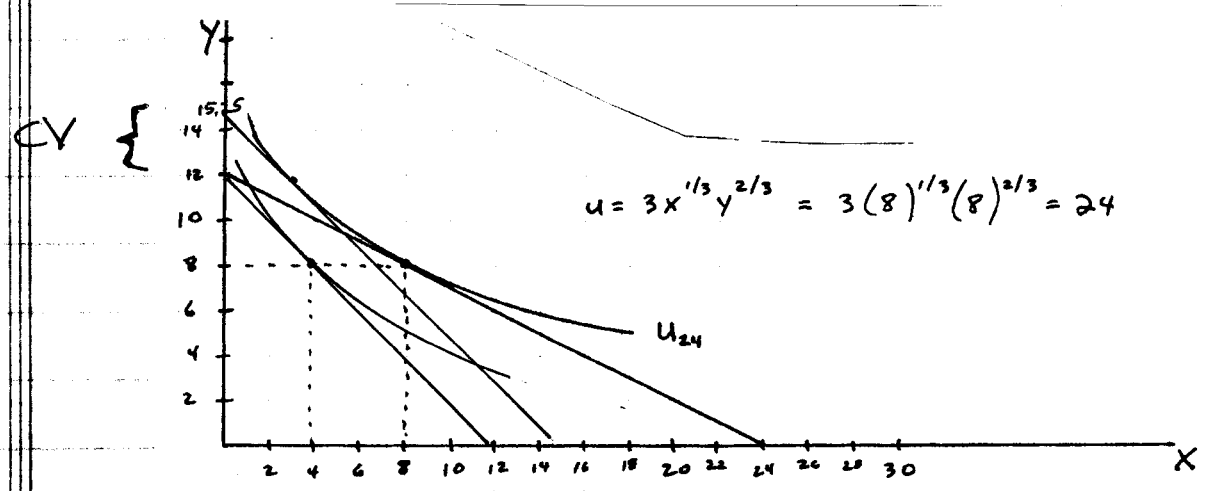
4.



P_x	d_x	h_x
1	16	12.7
2	8	8
4	4	5.04
8	2	3.175

Consumer's Surplus = $\int_0^4 (8 - 2X) dX + \int_4^8 (4 - 2X) dX = \12

Compensating Variation = $\int_0^{5.04} (8 - 2X) dX + \int_{5.04}^8 (4 - 2X) dX \approx \13

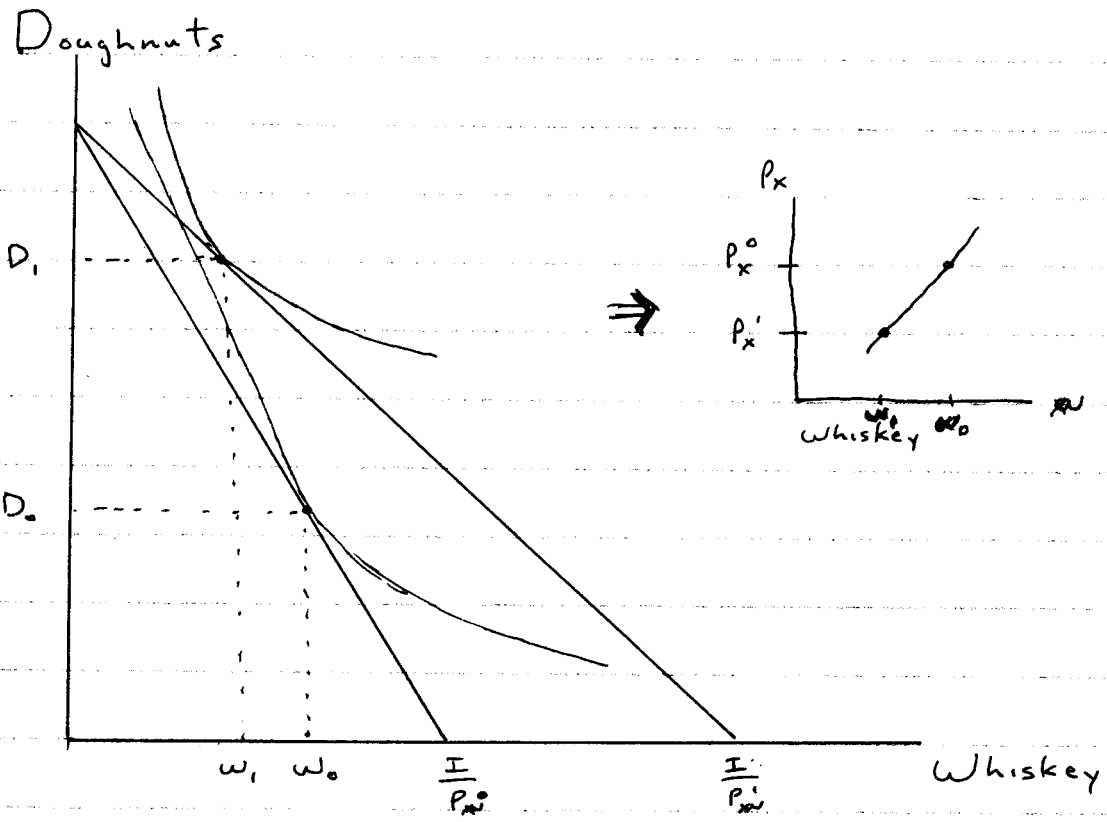


$$u = 3X^{1/3}Y^{2/3} = 3(8)^{1/3}(8)^{2/3} = 24$$

$CV = 3.25 \text{ units of } Y * \$4/\text{unit} \approx \$13$

CV = amount of income the consumer would need to be compensated with in order for them to attain the same level of utility as before the price of X rose.

5.



Rotgut whiskey is a Giffen good because Burt consumes more whiskey, w_0 , at the higher price P_x^0 , than he does, w_1 , at the lower price P_x^1 . When the price of whiskey goes up Burt's spending on whiskey also goes up, because he buys more whiskey at the higher price. His spending on jelly doughnuts must necessarily fall. Thus jelly doughnuts are a gross complement for rotgut whiskey, because an increase in the price of whiskey leads to a fall in the consumption of doughnuts.