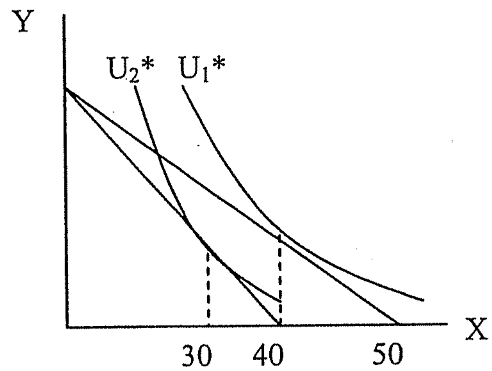
Econ 301
Deiter
Fall 2009
R In Class #7 (10 pts.)

Names Key

Each question sub part is worth 1 pt.

1. Demand analysis

a.



U_1: max $Q_x = \frac{I}{P_1} \Rightarrow 50 = \frac{400}{P_1} \Rightarrow P_1 = 8$

U_2: max $Q_x = \frac{I}{P_2} \Rightarrow 40 = \frac{400}{P_2} = P_2 = 10$

Based on the graph above, assuming the consumer's budget for expenditures on Y and X is \$400, identify two points on this consumer's demand curve for X.

P_1 = 8 Q_1 = 40

P_2 = 10 Q_2 = 30

b. In a) above, if the consumer's utility-maximizing, equal-slopes condition is Y = 2X, what is the equation of this consumer's demand for X?

(1) X = .5y
(2) X = $I - P_X - 2P_Y$
(3) X = $I/(2P_X + P_Y)$
(4) X = $I/(P_X + 2P_Y)$
(5) X = $(P_Y + 2P_Y)/I$

$I = P_x X + P_y Y$
$\Rightarrow I = P_x X + P_y (2X)$
$\Rightarrow I = X(P_x + 2P_y)$
$\Rightarrow X = I/(P_x + 2P_y)$

2. Refer to our "intertemporal choice" model from Unit 3 for definitions of terms in this question. Assume Daunte has I_0 = \$12,000, I_1 = \$25,040, and r = 8%.

a. What is the equation of Daunte's budget constraint, assuming C_1 is the vertical axis variable and C_0 is the horizontal axis variable.

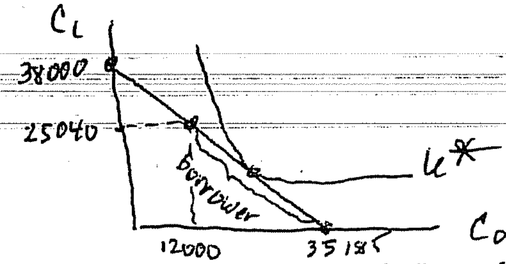
$C_1 = I_0(1+r) + I_1 - (1+r)C_0$

$= 12000(1.08) + 25{,}040 - (1.08)C_0 \Rightarrow \boxed{C_1 = 38000 - 1.08C_0}$

b. How can Daunte increase C_0 by \$1,000, assuming neither I_0 nor I_1 can be changed?

$\frac{\Delta C_1}{\Delta C_0} = \frac{-1.08}{+1} \Rightarrow \frac{1000(-1.08)}{1000(+1)} = \frac{-1080}{+1000} \Rightarrow$ if ↑ C_0 by 1000 must ↓ C_1 by 1080

c. Draw a graph that shows Daunte being a borrower while maximizing his utility (assume bowed indifference curves as C_1 and C_0 are normal goods for Daunte).



3. Suppose a 'marketing' team had observed the P and TR results in the table below. Based on these results, complete the Q (000) column (recall TR = P x Q).

P	TR ($000)	Q (000)
24.00	1104	46
33.00	1386	42

a. Complete the table above and derive the apparent equation of the firm's linear demand curve.

$P = a - bQ \Rightarrow -b = \frac{\Delta P}{\Delta Q} = \frac{+9}{-4} = -2.25$

$\Rightarrow a = P + 2.25Q$

$= 24 + 2.25(46) = 127.50$

$\Rightarrow P = 127.50 - 2.25Q$

b. Based on your answer to 3a), what is the firm's TR equation as a function of Q (= quantity of sales)?

$TR = PQ$

$= (127.5 - 2.25Q)Q$

$= 127.5Q - 2.25Q^2$

c. At what value of Q is TR maximized (i.e. the slope of TR = MR = 0)?

$MR = \frac{dTR}{dQ} = 127.5 - 4.5Q = 0$

$\Rightarrow Q = \frac{127.5}{4.5} = 28\frac{1}{3}$

d. What is the P that corresponds to the Q that maximizes TR from 3C?

$P = 127.5 - 2.25(28\frac{1}{3})$

$\Rightarrow P = \$63.75$

e. What is the maximum dollar of sales this firm could have generated in any one year?

Max $TR = PQ$ at $Q = 28\frac{1}{3}$

$= (63.75)(28\frac{1}{3}) = \$1806.25$