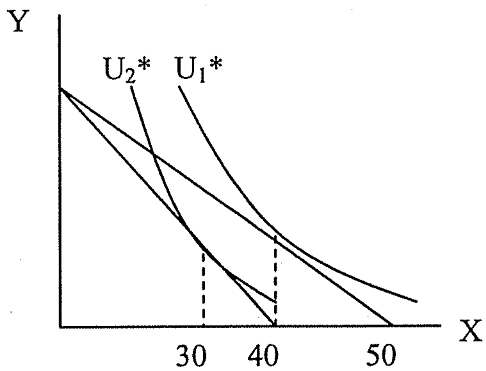
Econ 301
Deiter
F'08
W In Class #7 (10 pts.)

Names Key

Each question sub part is worth 1 pt.

1. Demand analysis

a.



U_1: max $Q_X = \frac{I}{P_1} \Rightarrow 50 = \frac{600}{P_1} \Rightarrow P_1 = 12$

U_2: max $Q_X \Rightarrow 40 = \frac{600}{P_2} \Rightarrow P_2 = 15$

Based on the graph above, assuming the consumer's budget for expenditures on Y and X is \$600, identify two points on this consumer's demand curve for X.

P_1 = 12 Q_1 = 40
P_2 = 15 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 = \$10,000, I_1 = \$29,000, and r = 10%.

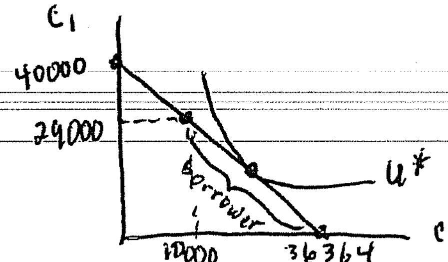
a. What is the equation of Daunte's budget constraint, assuming C_1 is the vertical axis variable and C_0 is the horizontal axis variable.

$C_1 = I_0(1+r) + I_1 - (1+r)C_0$
$= 10000(1.1) + 29000 - (1.1)C_0 \Rightarrow C_1 = 40000 - 1.1C_0$

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

$\frac{\Delta C_1}{\Delta C_0} = \frac{-1.1}{1} \Rightarrow \frac{1000(-1.1)}{1000(+1)} = \frac{-1100}{+1000} \Rightarrow$ if ↑ C_0 by +1000, must ↓ C_1 by 1100

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	1320	40

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

$P = a - bQ$ $\quad -b = \frac{\Delta P}{\Delta Q} = \frac{+9}{-6} = -1.5 \Rightarrow P = a - 1.5Q$

$\Rightarrow a = P + 1.5Q$

$\Rightarrow P = 93 - 1.5Q$ $\quad \Rightarrow a = 24 + 1.5(46) = 93$

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

$TR = P \cdot Q$

$= (93 - 1.5Q)Q$

$= 93Q - 1.5Q^2$

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

$MR = \frac{dTR}{dQ} = 93 - 3Q = 0$

$\Rightarrow Q = 31 \quad (000)$

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

$P = 93 - 1.5Q$

$\Rightarrow P = 93 - 1.5(31) = 93 - 46.50 = \$46.50$

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

Max $TR = PQ$ at $Q = 31$

$= (46.50)(31) = \$1,441.5 \quad (000)$