economic 101 fall 2017 Assignment 1 solutions

Qu 1

a) $Q_s = 2 + P$ | $P = 25 - 1.5Q_D$ (DEMAND)

$P = Q_s - 2$ | $P = -2 + Q_s$ (SUPPLY)

To find equil. set equations equal:

$Q_s - 2 = 25 - 1.5Q$

$Q + 1.5Q = 25 + 2$

$2.5Q = 27$

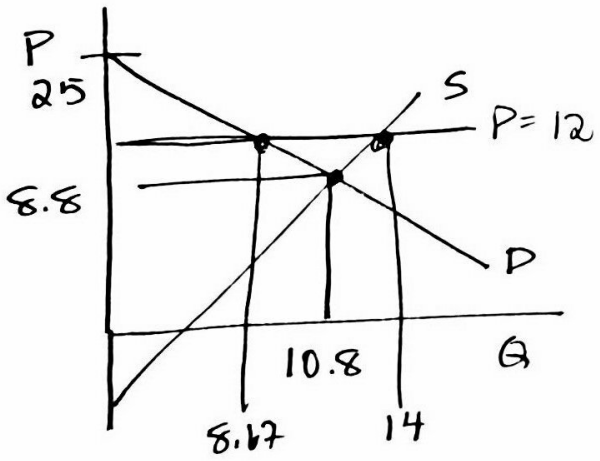
$Q = 10.8$ → PUT INTO equation to solve for P

$P = Q_s - 2$ $\qquad$ $P = 25 - 1.5Q$

$P = 10.8 - 2$ $\qquad$ $= 25 - 1.5(10.8)$

$= \underline{8.8}$ $\qquad$ $= \underline{8.8}$

b)



c) If $P = \$12$ REGULATED

$\underline{Q_S} = 2 + P = 2 + 12 = \underline{14}$

$\underline{Q_D} = 16.67 - .667P = \underline{8.67}$

AT > P @ 12 ↓ Q_D to 8.67

↑ Q_S to 14

EXCESS SUPPLY 5.33Q

d) SHIFT CREATED VIA 1 of 6 MAIN ELEMENTS

- TASTE + PREFERENCE
- RELATED GOODS - COMPL/SUBSTITUTES
- PRICE OF GOOD TO CHANGE IN FUTURE
- INCOME LEVEL CHANGE
- EXPECTED FUTURE INCOME/CREDIT
- POPULATION

} CHANGE IN THESE

QUESTION 2

$Q_D = 12 - P$ $\quad Q_S = 2P$

a) EQUIL P+Q

$Q_D = Q_S$

$12 - P = 2P$ $\quad Q_S = 8$

$12 = 3P$ $\quad Q_D = 8$

$P = 4$

$\Rightarrow \frac{Q_S}{2} = P$ (SUPPLY) Intercept = 0

$12 - Q_D = P$ (DEMAND) Intercept = 12

b) $Q_D = 12 - P$ $\quad Q_S = P$

$P = 6$ $\quad Q = 6$

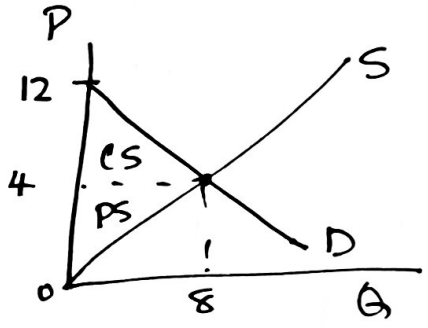
c) CHPTER 5 - COMING UP! FULL MARKS FOR ANY ATTEMPTS ✱

$CS = 32$

$CS = 18$

$\Delta = 18$

d)



AT ORIGINAL $P = 4$ $Q = 8$

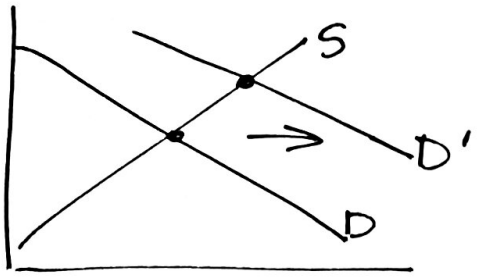
$CS = 1/2\,bh = \frac{1}{2} 8 * 8 = \underline{32}$

AT $P = 6$ $Q = 6$

$CS = \frac{1}{2} 6 * 6 = \underline{18}$

QUESTION 3

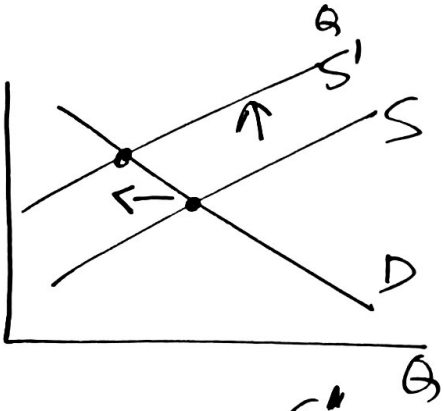
a)



EQUIL P↑ Q↑

HEAT WAVE

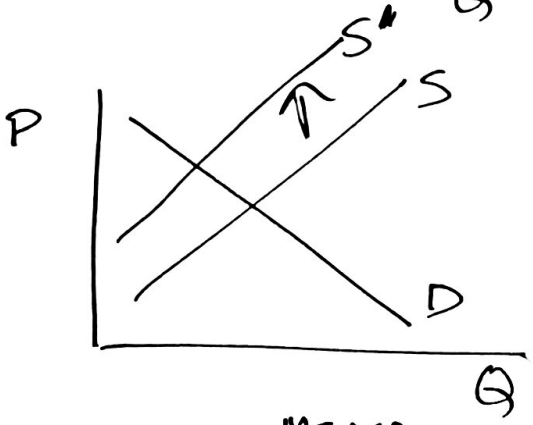
b)



EQUIL P↑ Q↓

MILK PRICE ↑

c)

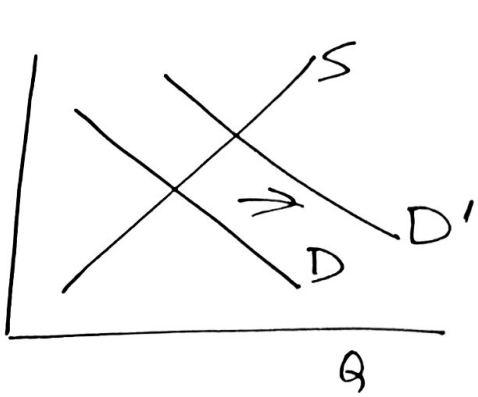


MEXICO

EQUIL P↑

Q↓

d)



CHINA

EQUIL P ↑↑

Q ↑

Question 4

a) P $6 → 6.06 Avg P = 6.03

Q 600,000 → 594,000 Avg Q = 99,010
6 6.06

100,000 ⇒ 98,020

$$\%\Delta q_Q = \frac{98020 - 100,000}{99010} = -2\%$$

$$\%\Delta q_P = \frac{(6.06 - 6)}{6.03} = 1\%.$$

$$\text{Elasticity of Demand} = \frac{\%\Delta Q}{\%\Delta P} = \frac{-2}{1} = \underline{2}$$

∴ 1% Δ Price ⇒ 2% Δ Q_D

↑ P ↓ Q_D

↓ P ↑ Q_D

b) P $0.48 → 0.52 Δ = .04 Avg P = .50

Q 10.1 → 9.9 Δ = .2 Avg P = 10.[redacted]

$$\%\Delta P = \frac{.04}{0.5} = 8\% \qquad \%\Delta Q = \frac{0.2}{10.[redacted]} = 2\%$$

$$\text{Elasticity of Demand} = \frac{\%\Delta Q}{\%\Delta P} = \frac{2\% = .25}{8\%}$$

Thus, A 1% Δ P ⇒ .25 % Δ Q_D

Qu 5)

a) INCOME ELASTICITY -2.5

$\Rightarrow$ IF INCOME ↑ Q_D OF GOOD ↓

INFERIOR GOOD

IF INCOME ↑ 10% THEN Q_D ↓ 25%

b) CROSS PRICE

GOOD B PRICE	↑ +.25
↑	Q_A

IMPLIES

P_B ↑ 10% $\Rightarrow Q_A$ +.25

THUS, SUBSTITUTE GOOD, BECAUSE IF P OF GOOD B ↑ THEN PEOPLE DECIDE TO BUY GOOD A INSTEAD SO Q_A ↑ .25. THE VALUE ↑ ~~OF .25~~ Q_{D_A} BUT NOT BY MUCH SO NOT A CLOSE SUBSTITUTE.

If P_B ↓ \$10 → \$9 Δ 1 AVG 9.5 % ΔP = 10.5%

THEN P_B ↓ 10.5% Q_A ↓ 10.5 * .25 = 2.6

c) 3.4, 1.0, .5 > ALL (+) WITH INCOME, NORMAL GOOD

- MOVIES > SENSITIVITY TO P
- DENTAL → UNITARY ELASTICITY
- CLOTHES → LITTLE EFFECT WITH P Δ

NEGATIVE - INFERIOR GOOD

QUESTION 6

a. Describe the three types of elasticity of demand and give one example of each of these types.
b. Discuss how elasticity can be used in managerial decision making

a)

- Perfectly Inelastic
  - Quantity demanded does not respond to price changes.
  - Ex: medicine required to live, gasoline for cars, oil, - any reasonable and justified answer is fine.
- Perfectly Elastic
  - Quantity demanded changes infinitely with any change in price.
  - Ex: any good with many substitutes because a small change in price will make the person move to another product and buy that product
- Unit Elastic
  - Quantity demanded changes by the same percentage as the price.
  - Ex: no real definite type of products but nay product where 1% increase in price creates a 1% decrease in Qd and vice versa

b. Lecture 6 Slides 41 onwards

In business, the firm will want to discover the relationship between Qd and Price and thus the resulting effect on total revenue. This determines price strategy as to whether it is a good idea to raise or lower the price of the good because the firm always want to increase revenue as a result of the price strategy. Firms use elasticity to be able to predict the results of the price change and resulting effect not just on quantity demand but on total revenue. See table below for important P and Q to total revenue results.

Elasticity	**Changes in Price**	**Changes in Total Revenue**
$\varepsilon_D < 1$	Increases	Increases
	Decreases	Decreases
$\varepsilon_D = 1$	Increases	Unchanged
	Decreases	Unchanged
$\varepsilon_D > 1$	Increases	Decreases
	Decreases	Increases

QUESTION 7

$Q_D = 8 - P$ $Q_S = \frac{1}{2} P - 1$

a. Calculate the equilibrium price and quantity.
b. Please graph this problem labeling all lines, axes, and the equilibrium, price, slope, intercept and quantity
c. The government institutes a price support program where the support price is $4. Calculate the resulting shortage or a surplus value and then show this on the same graph in part b.
d. The government institutes a price support program where the support price is $10. Calculate the resulting shortage or a surplus value and then show this on the same graph in part b.

a) $Q_S = Q_D$

$8 - P = \frac{1}{2}P - 1$

$8 + 1 = \frac{1}{2}P + P$

$9 = 1\frac{1}{2}P$

$P = 6$

$Q_D = 8 - P$

$= 8 - 6$

$= 2$

OR

$Q_S = \frac{1}{2}P - 1$

$= \frac{1}{2}6 - 1$

$= 2$

∴ EQUILIBRIUM $P^* = 6$ $Q^* = 2$

b) PUT INTO $P =$ ⇒ FORMAT

$Q_D = 8 - P$

$P = 8 - Q_D$

$Q_S = \frac{1}{2}P - 1$

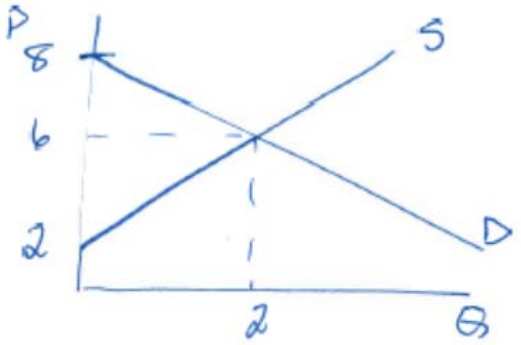
$\frac{1}{2}P = Q_S + 1$

$P = Q_S + 1 \left(\frac{2}{1}\right)$

$P = 2Q_S + 2$

∴ $P = 8 - Q_D$ slope $= -1$ int $= 8$

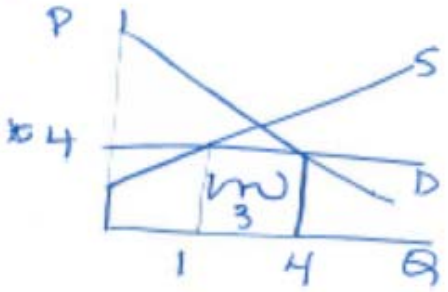
$P = 2Q_S + 2$ slope $= 2$ int $= 2$



1c PRICE SUPPORT = 4

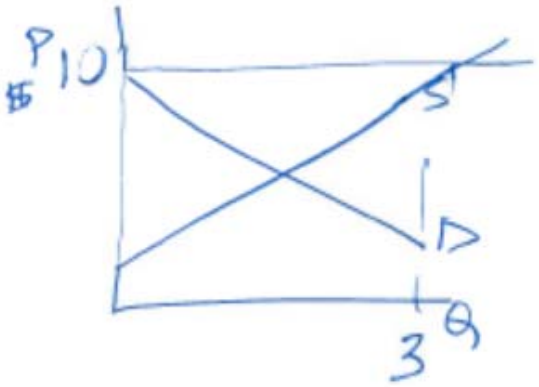
PUT P=4 INTO Q_S + Q_D

$Q_S = 1$
$Q_D = 4$ > SHORTAGE = 3



1d PRICE SUPPORT = 10

$Q_S = 4$ > SURPLUS = 4
$Q_D = \emptyset$ (NO CONSUMER IS WILLING TO PURCHASE AS PRICE IS TOO HIGH)



QUESTION 8

Provide a value and explanation for each of the following. Be sure to note if these products are complements, substitutes or unrelated in your explanation.

a. An increase in the price of chicken from $1.50 to $2.10 per pound increased the average packages of turkey demanded per week from 300 to 360 Assuming that all other economic variables were held constant, the cross-price elasticity of demand between chicken and turkey is _____ which indicates that the two goods are _____/

b. A café observed an increase in the demand for its milk following a rise in the price of a cup of iced tea from $1.20 to $1.50. Assuming the cross-price elasticity of demand for milk with respect to a change in the price of iced tea is +0.8, by how much (in per cent) will the demand for milk have increased?

c. The price of good X falls by 15 %. As a result, the demand for a substitute good Y rises by 30 %. What is the cross-elasticity of demand for good Y with respect to good X?

d. If the cross-price elasticity of demand for samosas and sushi is 0.6 and presently 1000 units of samosa are consumed, how many units of samosas will be consumed if the price of sushi increases by 10%?

Qu 8/

a) $P_C \Delta$ 1.50 → 2.10 Δ +.60 ¢ AVG = 1.80 CHICKEN

$Q_T \Delta$ 300 → 360 Δ +60 AVG 330 TURKEY

+ So, CROSS PRICE ELASTICITY OF DEMAND SUBST

$\%\Delta P = \frac{.60}{1.80} = {}^{+}.3333$ $\%\Delta Q = \frac{60}{330} = {}^{+}.1818$

$\varepsilon = \frac{\%\Delta Q_T}{\%\Delta P_C} = \frac{{}^{+}.1818}{+.3333} = +.54$

Sign is + so Substitutes but value is small (.54)
so not close substitutes or big level of response

b) $P_T \Delta$ 1.20 → 1.50 $\Delta P = .30$ AVG P = 1.35 $\%\Delta P = {}^{+}.222$

Q_{MILK} ? CROSS P $\varepsilon = +.8$

If P ↑ .222 then QD of milk (.222)(.8) = .1776

+ implies SUBSTITUTE PRODUCT

Value ↓ they are not close substitutes.

c) P_X ↓ 15% Q_Y ↑ 30%

$\varepsilon = \frac{+30}{-15} = -2$

− implies complements

2 value implies strong complements.

d) $\varepsilon = +.06$ IMPLIES

Price of sushi increases results in a Qd of samosa increase because they are substitutes.
In this case, price increase of sushi creates a Qd change of 60 samosas. So, increase from 1000 to 1060.

QUESTION 9

Oatmeal is an inferior good and cold cereal is a substitute for oatmeal. The cross-price elasticity of Raisin with respect to oatmeal is negative.

Using a well-labeled graph show the effect on the oatmeal market for each of the following. (Please also provide a brief explanation of the relationship (e.g., positive/negative) and the reasons/logic for the relationship.

a. An increase in the price of raisins.
b. An increase in income.
c. A decrease in population size.
d. An increase in the price of cold cereal

Qu 9 / OATMEAL INFERIOR GOOD

⇒ ↑ INCOME ↓ D_O OATMEAL

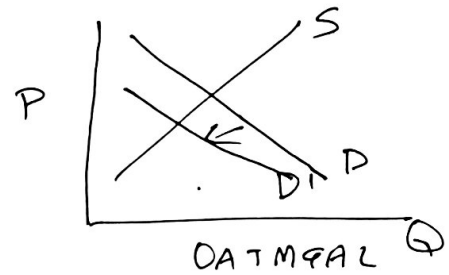
OATMEAL + RAISINS

⇒ ↑ $P_{RAISINS}$ ↓ D_O OATMEAL, COMPLEMENTS

~~A~~ ALL D CURVE SHIFTERS

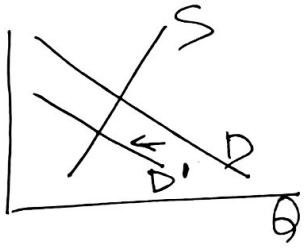
R = RAISINS
O = OATMEAL

a)



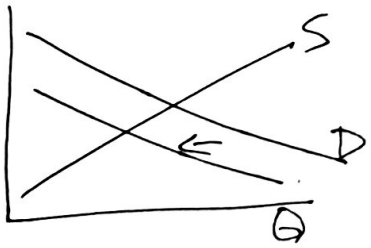
↑ P_R ⇒ ↓ D_O (D')

b)



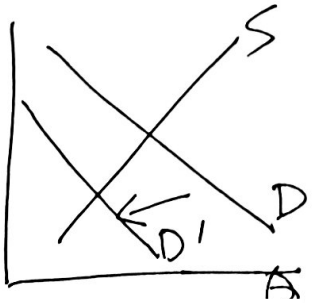
↑ INCOME ↓ D_O (D')

c)



↓ POP SIZE ↓ D_O (D')

d)



cereal market

↑ P_{cereal}

decrease in Qd of cereal results in increase in Qd in oatmeal - rightward shift of demand curve in oatmeal mkt