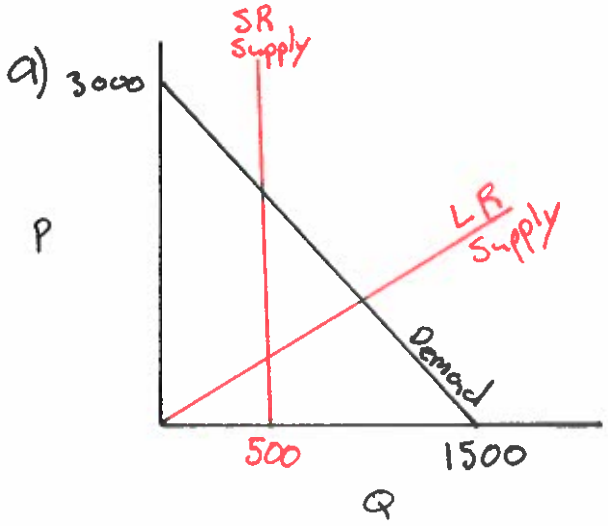
The Problem Set
COMM 407
Solutions

Question 1

a)



b) SR Supply = Demand

$500 = 1500 - 0.5p$

$0.5p = 1000$

$p = 2000$

$q_d = 1500 - 0.5p$

$q_d = 1500 - 0.5(2000)$

$q_d = 500$

c) LR Supply = Demand

$2p = 1500 - 0.5p$

$2.5p = 1500$

$p = 600$

$q_d = 1500 - 0.5p$

$q_d = 1500 - 0.5(600)$

$q_d = 1200$

d) $P_s = P_d - 500$ (suppliers receive the price paid by consumers, minus the $500 tax)

$q_s = q_d$

$2P_s = 1500 - 0.5P_d$

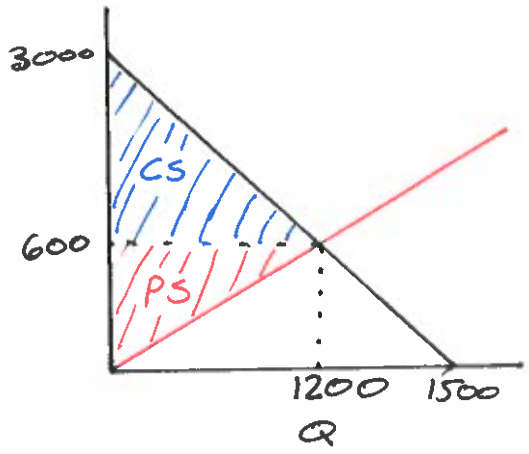
$2(P_d - 500) = 1500 - 0.5P_d$

$2P_d - 1000 = 1500 - 0.5P_d$

$2.5P_d = 2500$

$P_d = 1000$

e) Before Tax



P

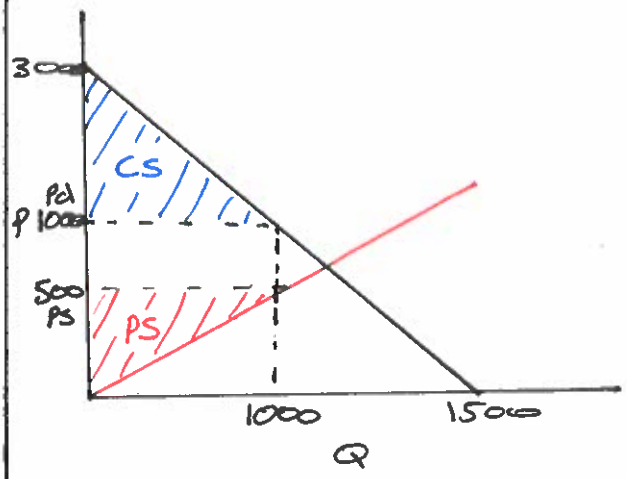
$CS = \frac{2400 \times 1200}{2} =$

$= 1{,}440{,}000$

$PS = \frac{600 \times 1200}{2}$

$= 360{,}000$

After Tax



$CS = \frac{2000 \times 1000}{2} = 1{,}000{,}000$

$PS = \frac{500 \times 1000}{2}$

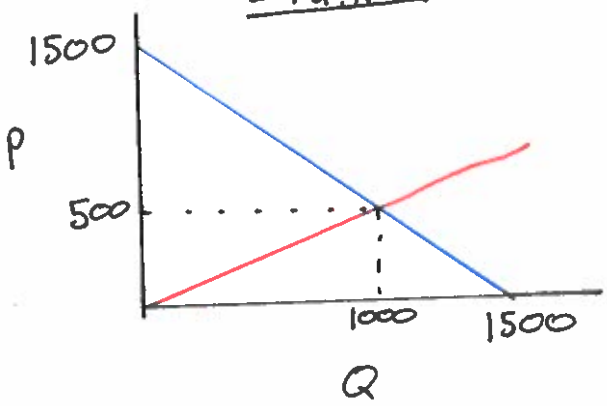
$= 250{,}000$

Producer surplus falls by 110,000
Consumer suplus falls by 440,000
There is a dead weight loss.

f) No. If quantity can not change, the DWL must be zero.

Question 2. a)

Elástico



$2p = 1500 - p$

$3p = 1500$

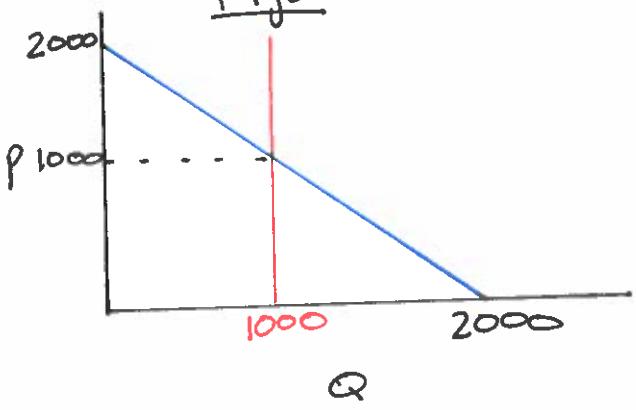
$p = 500$

$q = 2p$

$q = 2(500)$

$q = 1000$

Fijo



$q = 1000$

$q = 2000 - p$

$1000 = 2000 - p$

$p = 1000$

b) Elástico

$q_s = 2p = 2(400) = 800$

Fijo

$q_s = 1000$

c) Elástico

CS before policy:

$\frac{1000 \times 1000}{2} = 500{,}000$

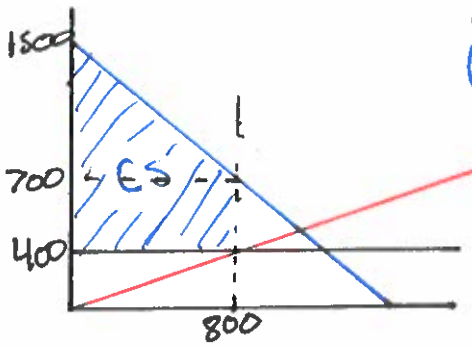
CS After:

$(\frac{800 \times 800}{2}) + (300 \times 800)$

$= 560{,}000$

Change:

$\uparrow 60{,}000$



Fijo

CS before policy:

$\frac{1000 \times 1000}{2} = 500{,}000$

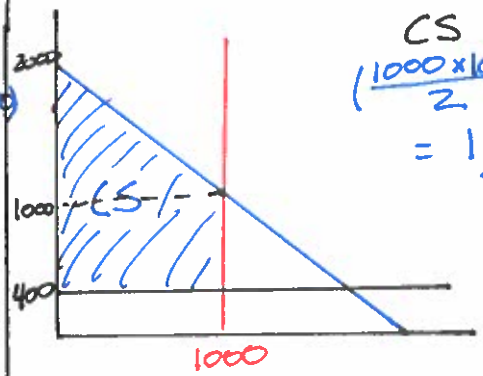
CS After:

$(\frac{1000 \times 1000}{2}) + (600 \times 1000)$

$= 1{,}100{,}000$

Change:

$\uparrow 600{,}000$

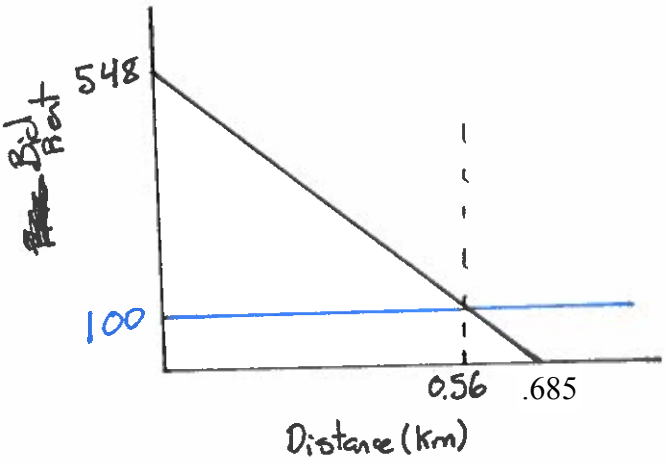


d) The policy resulted in fewer homes in Elástico provided. Although, consumes surplus still increased, so policy is likely popular.

In Fijo, all consumers in the housing market are better off so the policy will be popular.

Question 3.

a)



Find size of city:

250 acres = $1 km^2$

$A = \pi r^2$

$r = \sqrt{\frac{A}{\pi}}$

$r = \sqrt{\frac{1 km^2}{\pi}} = 0.56 km$

Slope of bid rent line:

$-\left(\frac{\pm}{R}\right) = \frac{200}{0.25} = 800$

y-intercept is: $100 + (800 \times .56)$

$= 548$

Bid Rent $= -800d + 548$

$0 = -800d + 548$

$800d = 548$

$d = .685$

b) 0.56km from city center c) $548

d) Households with higher transportation costs will choose to locate closest to the city cater. All ~~workers~~ Walkers locate closer to city cater than Drivers.

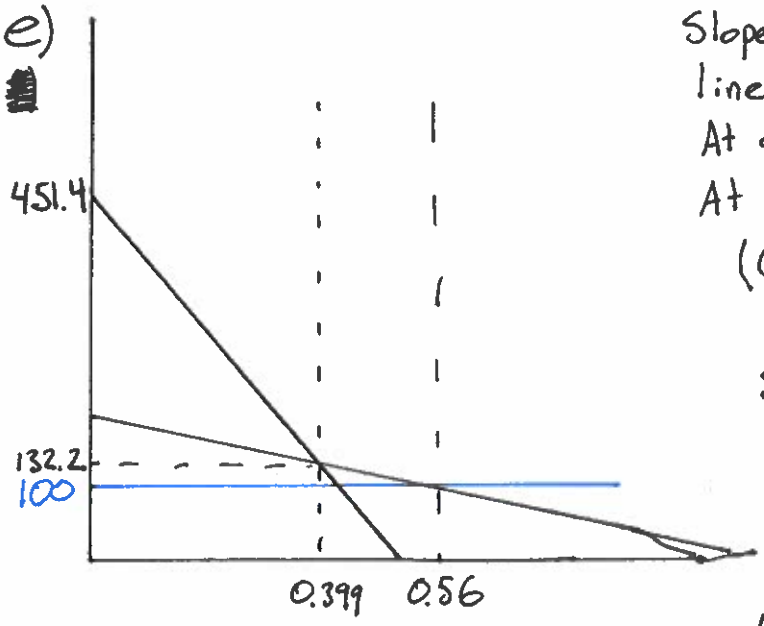
500 Walkers, $\frac{1}{4}$ acre each = 125 acres
= 0.5 km²

$0.5\text{km}^2 = \pi r^2$

$r = \sqrt{\frac{0.5\text{km}^2}{\pi}} = 0.399\text{km}$

At $\boxed{d = 0.399}$, the residetial population changes from Walkers to Drivers.

e)



Slope of Drivers' Bid Rent line: -200
At d=0.56 BR=100
At d=0.399 BR=
(0.56-0.399)×200 +100
=132.2

Slope of Walkers' Bid Rent line: -800
At d=0.399 BR=132.2
At d=0 BR=
(0.399)×800+132.2
$\boxed{= 451.4}$

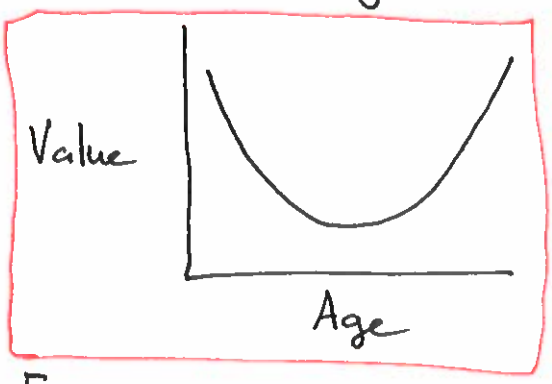
Question 4

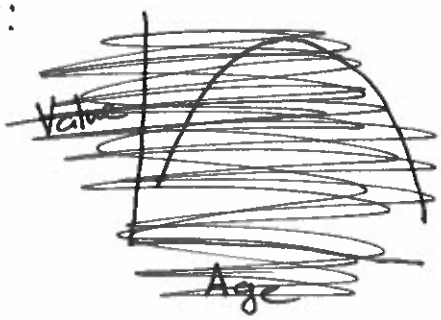
a) Price = $322379 + 77123.9(2) + 200219.5(1) + (-9150.28)(20) + 114.9657(20^2) + 432142.2(1) + 2564615(0)$

$= \$971{,}969.18$

b) If we controlled for all unobservable and observable differences between homes it would equal the value buyers place on having a pool.
Because we likely failed to include sufficient controls the estimate will be biased.

c) The relationship between home value and home age looks something like this:





For example: Going from 0 to 1 year old changes value by: $-9150 + 115 = -9035$

Going from 100 to 101 years old:

$-9150 \times 100 + 115 \times 100^2 = 235000$

$-9150 \times 101 + 115 \times 101^2 = 248965$

$+13{,}965$

For newer homes age reduces value
For very old homes age increases value.

d) 40.17%

e) All of them!

Question 5

a) The headline is factually accurate, but fails to attribute the price change to the change in types of homes sold.

b) 1 Main Street and 2 Water Street - Unit 1 are the repeat sales. Neither change in value. Average appreciation = 0%.

c) 2016 price: $400,000

Comparable 2017 price: 400,000 - 20,000 = 380,000

Price fell by $20,000
or 5%

Question 6

a) $R_M = 500 \times 1000 = \$500,000$
$R_D = 500 \times 400 = \$200,000$

b) A household with children gets the following payoffs

Manette: $10000 - 1000 + 4\sqrt{(500 \times 1000)} =$ [redacted] 11828

Defarge: $10000 - 400 + 4 \times \sqrt{(500 \times 400)} = 11389$

Households with children prefer Manette

No children:

Manette: $10000 - 1000 + 0 = 9000$

Defarge: $10000 - 400 + 0 = 9600$

Households with no children prefer Defarge

No children will live in Defarge.

c) Defarge will select a tax rate of 0.

$(T_D = 0)$

At Manette's original tax rate ($T_M = 1000$) residents receive the following payoff:

$$10000 - 1000 + 4\sqrt{(500 \times 1000)} = 11828.427$$

Consider if taxes were raised to $T_M = 1001$:

$$10000 - 1001 + 4\sqrt{(500 \times 1001)} = 11828.841$$

Consider if taxes were lowered to $T_M = 999$

$$10000 - 999 + 4\sqrt{(500 \times 999)} = 11828.013$$

Payoff is highest when $T_M = 1001$, compared to $T_M = 1000$ or $T_M = 999$.

It would be more popular to marginally raise taxes in Manette.