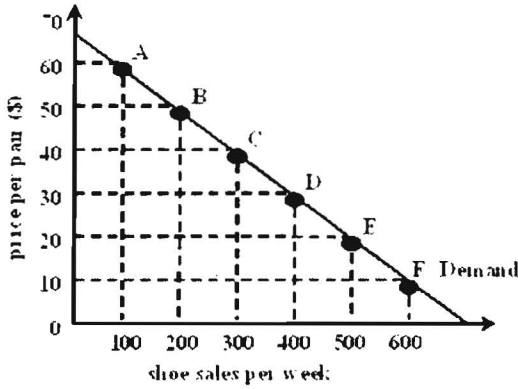


Question 1 (30 points)

Nike(inc), decides to bring back an old line of men's shoe ware in the year 2014. They hire you, as the financial stagiest to finalize the price that would maximize their profits.

They hand you the data from previous year (1994) on price and 'quantity demanded' for this line of shoe. After plotting these numbers you come up with a demand function for these shoes:



- a) (2 points) (Fill in the blank) The Demand equation is:  $Q_D = 700 - (10) p$   
(hint: confirm your answer by checking  $Q_D$  for  $p=10$  from your equation and matching it with the graph)
- b) Calculate the total revenue at different points on the graph (Just fill in the blanks) (3 points)

Total Revenue at Price \$10 is 6000 ;  
 Total Revenue at price \$30 is 12000 ;  
 Total Revenue at price \$50 is 10000 ;

Then, you analyze the change in total revenue. (just circle one) (1 point)

Total Revenue (increases/decreases) as price is increased from \$10 to \$30  
 Total Revenue (increases/decreases) as price is increased from \$30 to \$50

You were about to do this exercise for all the 1000s of points on the demand curve, but then you suddenly remembered your econ 101 lectures, and realized that there was an easy way to answer this-price elasticity of demand!

- c) Let "P" be the price where the demand function has unit elasticity.  
(For following parts just circle the right answer)
  - i. For prices above this price "P" demand is (elastic/inelastic) (1 point)
  - ii. For prices below this price "P" demand is (elastic/inelastic) (1 point)
  - iii. Above this price "P", total revenue (increases/decreases) as the price is **increased**. (2 points)  $P \uparrow Q_D \downarrow$
  - iv. Below this price "P", total revenue (increases / decreases) as the price is **decreased** (2 points)  $P \downarrow Q_D \uparrow$
  - v. Find (and prove) the price "P" at which the demand is unit elastic (please show your work here). (4 points)  
"P" = 35

mid point of the demand function price ranges from 0 to 70 midpoint=35

Proof:  $\epsilon$  (at  $p=35$ ) = 1

it's a mid point between B & C

$$\frac{\% \Delta \text{ in } Q^d}{\% \Delta \text{ in } P} = \frac{\frac{400 - 300}{300 + 400}}{\frac{30 - 40}{30 + 40}} = \frac{\frac{100}{350}}{\frac{-10}{35}} = \frac{10/35}{10/35} = 1$$

↗ Quantity where  $\epsilon = 1$   
↖ price where  $\epsilon = 1$

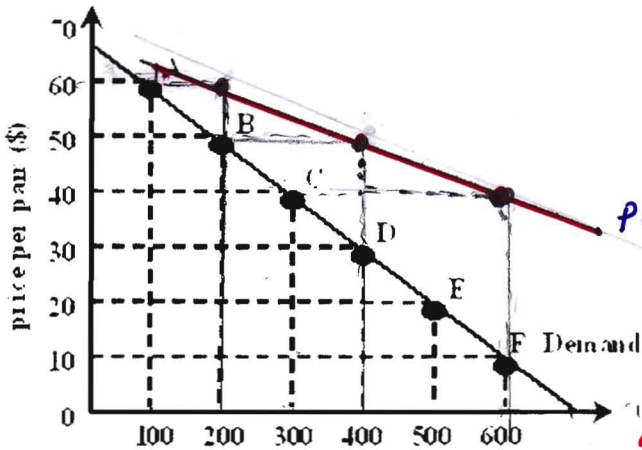
vi. Total Revenue is maximized at price \$ 35 (1 point)

**ORIGINAL DEMAND**  $\rightarrow 700 - 10P$      $\theta_D = 700 - 10P$

d) You realize that the data for the demand function is from the year 1994, and in the last 20 years the Canadian economy has grown, and the GDP per capita has increased by 20%. Given that the income elasticity of demand for Nike shoes is 5, how does this change the demand equation, and the demand graph?

The new demand equation is  $\theta_D = 1400 - 20P$  (2 points); and at price 30\$ the Q is 800 (1 point)

(Please show changes on the following graph and explain your answer in 1 to 2 sentences). (3 points)



$\frac{\% \Delta \ln \theta^D}{\% \Delta \ln \text{Income}} = 5$      $\frac{\% \Delta \ln \theta^D}{20\%} = 5$

$\% \Delta \ln \theta^D = 5 \times 20 = 100\%$

At every "price"  $\theta^D$  increases by 100%.

$P = 50 \theta^D = 400$ ;  $P = 60 \theta^D = 200$ ;  $P = 20 \theta^D = 1000$

- As Income increases there is a rightward shift of the demand function

- Nike shoes are a normal good so as income increases you buy more of the good at the same price.

New shoe sales per week

Slope =  $\frac{\text{Rise}}{\text{Run}} = \frac{50 - 40}{400 - 600} = \frac{1}{20} \Rightarrow P = 70 - \frac{1}{20} \theta_D \Rightarrow \theta_D = 1400 - 20P$

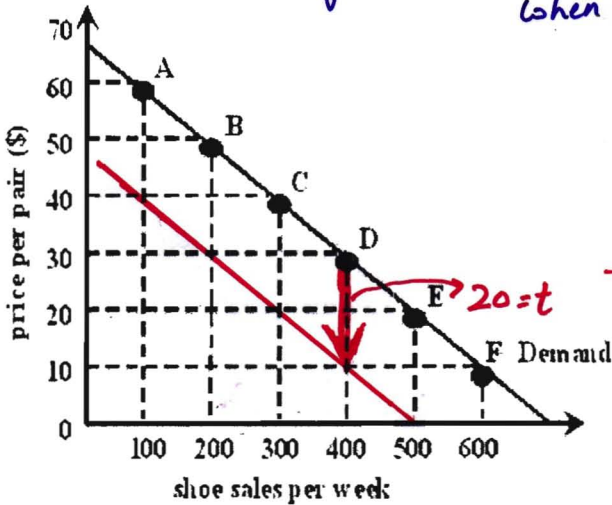
e) Show what happens to the demand function on the graph and the demand equation if the govt. imposes a consumer tax of 20 dollars on each pair of shoe.

The new demand equation is  $\theta_D = 500 - 10P$  (2 points), and at price 30\$ the Q is 200 (1 point)

(Please show changes on the following graph and explain your answer in 1 to 2 sentences). (3 points)

Answer

- At every point consumers adjust for 20 dollar tax when  $P = 0 \theta^D = 500$



Demand gives us - maximum consumers are willing to pay. (pay for the product)

- if the govt. charges them 20\$ in taxes

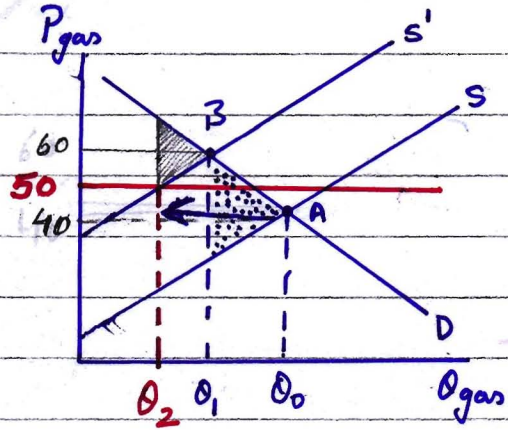
- The maximum they are willing to pay (would decrease by 20\$) adjust by tax

For  $(100 = \theta)$  max<sup>m</sup> willingness to pay was 60 now it would be 40

Consumer tax of 20\$ the demand curve shifts down by 20.



Q2 OPEC



Initial equilibrium - A

- ① Embargo (cut supply) by OPEC
  - ss function shifts to the left. ( $\leftarrow$ )
  - new eq<sup>b</sup> is at point B
  - Quantity decreases from  $Q_0$  to  $Q_1$

3 pts explanation + graph

- ② Nixon imposes a price ceiling of 50 as shown on the graph

- Quantity supplied further decreases to  $Q_2$ .

3 pts explanation + graph

- Yes, Dead weight loss arising from the price ceiling is shown by the grey shaded region
  - $(Q_2 - Q_1)$  is the shortage caused by the price ceiling
  - the  $(MB > MC)$  for the  $(Q_2 - Q_1)$  which gives rise to the DWL.

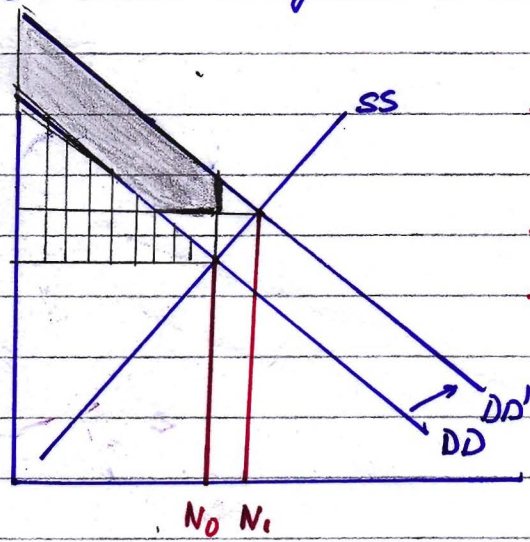
1 pt

- Should we think of the embargo as causing DWL (yes since  $MB > MC$ ) for the (reduction in  $Q_{gas}$ ).

- Just for the embargo the DWL is the dotted region.
- [ we'll discuss this further in the exam ]

1 pt

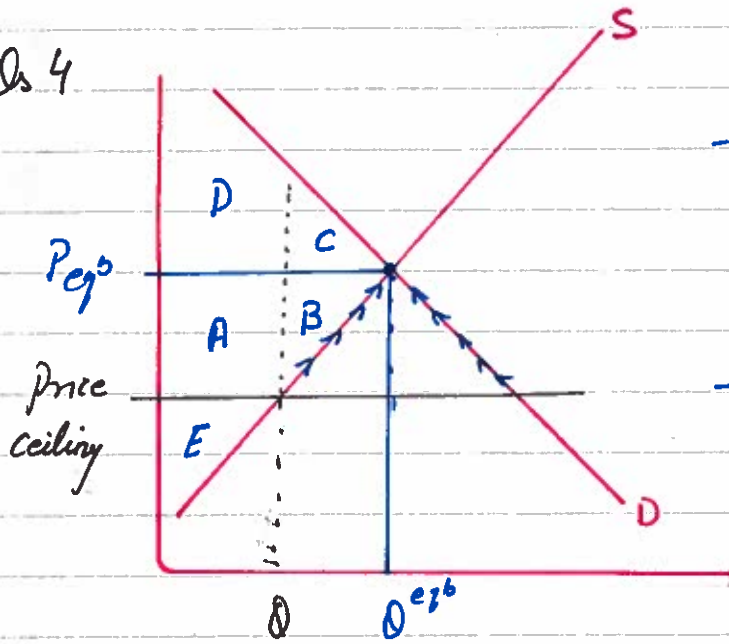
Q3



- $\rightarrow$  Demand for labor increased
- $\rightarrow$  dd shifts to the right
- $\rightarrow$  employment increased from  $N_0$  to  $N_1$
- $\rightarrow$  Business employers - Demanding labor
- So we need to think about the consumer surplus

4 pts

Qs 4



- Regulation is removed.  
 price rises to  $P_{eq}$   
 movement along the DD & SS.

- Consumer Surplus Changes  
 $= [C - A]$   
 - producer Surplus  
 $= [+ (A + B)]$

Changes in CS & PS  $\Rightarrow$  D.W.L =  $(+ (B + C))$

Total Surplus increases by the amount of the DWL =  $(B + C)$

The economy gains back the loss that was caused by the ceiling

- This is the same question as the video but reversed.