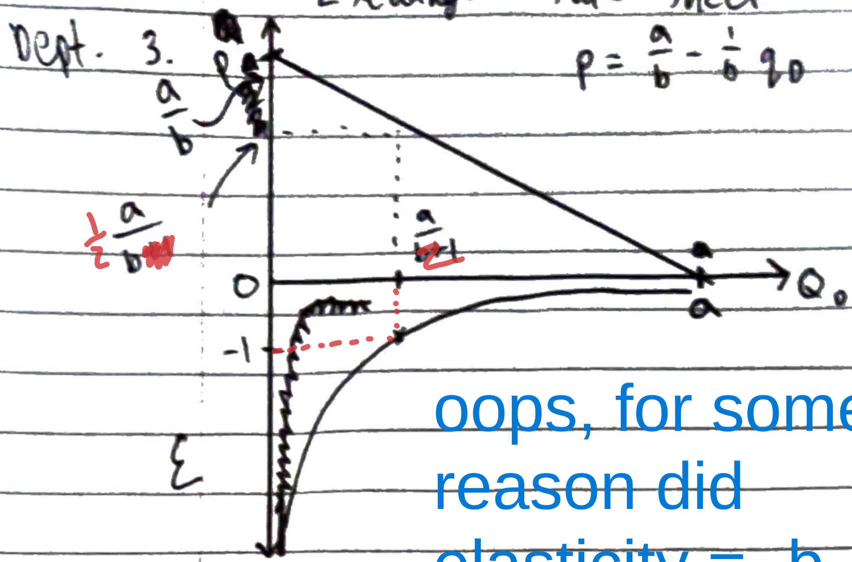
V Nice work

Exchange tute sheet

Dept. 3.

$p = \frac{a}{b} - \frac{1}{b} q_D$



oops, for some reason did elasticity = -b

definition / substitution

$$\varepsilon = \underbrace{\frac{\Delta q_D}{\Delta p}}_{-b} \cdot \frac{p}{q_D} = \underbrace{-b}_{\text{constant}} \frac{p}{q_D}$$

$\varepsilon = -1$ when $bp = q_D$ i.e.

$$\frac{a}{b} - \frac{1}{b} q_D = q_D,$$

$$a = (b+1) q_D$$

$$\frac{a}{b+1} = q_D = p$$

when $q = \frac{a}{2}$

When prices are very high, even super-eager buyers won't want anything, as it's above the first buyer's reservation price. As soon as the price falls below that, suddenly some quantity is demanded by the very first buyers, so elasticity asymptotes to $-\infty$ at low quantities. As the price falls further, q_D becomes less sensitive as more people now have their wants met, and the rest are less interested in buying the good than early buyers. At the satiation point, no price, regardless how low, could possibly persuade people that they want more of the good, so q_D is insensitive to p.

Ok good. Make it clear that this is all about percentage changes.

4a) $\log p = \frac{1}{2} \log q_s - 5$

$$\text{or} \quad p = e^{-5} \sqrt{q_s} \qquad [\text{assuming } \log = \text{base } e?]$$

b) Taking derivatives of the inverse supply function w.r.t. q_s

$$\frac{1}{p}\frac{dp}{dq_s} = \frac{1}{2q_s}, \quad \text{and} \quad \varepsilon = \frac{\Delta q_s}{\Delta p} \times \frac{p}{q}$$

$$\text{So we have} \quad \frac{dq_s}{dp} \times \frac{p}{q} = 2 = \varepsilon$$

i.e. the elasticity of supply does not vary along the curve.

8 a) $\varepsilon = -0.5 = \frac{\Delta q_D}{\Delta p} \times \frac{p^*}{q^*}$ $q^* = 2 \div 0.1 = 20$

$\therefore \frac{\Delta q_D}{\Delta p} = \frac{-0.5 \times 20}{0.1} = -100$

So $q_D = a - 100p$ and using $(20, 0.1)$
$a = 30$

$\therefore p = 0.3 - \frac{1}{100} q_D$ and works with $(0.1, 20)$.

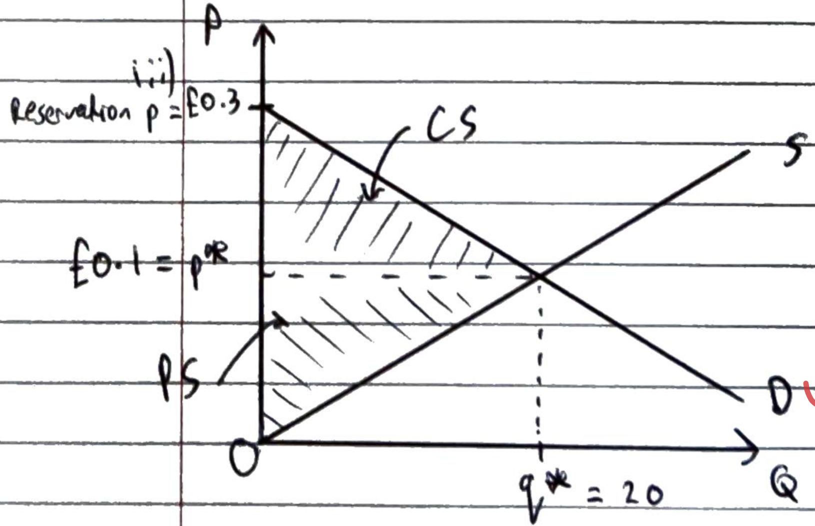
b) $q_s = c \times p^*$, ~~so~~ $c = \frac{q_s}{p^*} = 200$

$\therefore p = \frac{1}{200} q_s$

c) i) $CS = \frac{1}{2}(q^* \times (p_{resv.D} - p^*)) = 10 \times (0.3 - 0.1) = £2$ million
Total welfare gain to consumers of making these trades; the Σ WTP − Σ price for all units purchased; i.e. value of consumption to consumer net of price paid

Nice

ii) $PS = \frac{1}{2}(q^* \times (p^* - p_{resv.S})) = 10 \times (0.1 - 0) = £1$ million
Total welfare gain to consumers of making these trades: Σ price − Σ WTA for all units purchased, i.e. ~~value~~ ~~of~~ price producers are paid net of their valuation of the good.

iii)


~~Inverse~~

d) ~~i) Supply curve steepens, new $p_D = 1.2 p_S$~~

i) Inverse supply curve steepens.

Correct notation? i.e. price the consumer is charged → $p_D = \frac{3}{500} q_S$

and at new p_D, q, $\frac{3}{500} q = 0.3 - \frac{1}{100} q$

$\therefore q = 18.75$, $p_D = 0.1125$

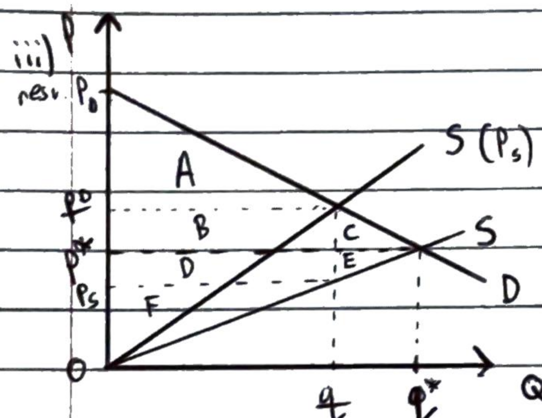
[and I think it makes sense it's gone up by less than $0.2 \times$ £0.1. Because demand is somewhat elastic?]

$DWL = \frac{1}{2}(20 - 18.75)\left(0.1125 - \frac{0.1125}{1.2}\right)$

$=$ £ 0.0117 million

ii) Gov't rev $= (p_D - p_S) \times q = 0.0125 \times 18.75$ = £0.234 million

iii)



Gov. rev $= B + D = q \times (p_D - p_S)$

$CS = A = \frac{1}{2}(q \times (\text{resv } p_D - p_D))$

$PS = F = \frac{1}{2}(q \times (p_S - 0))$

$DWL = C + E = \frac{1}{2}(q^* - q)(p_D - p^*) + \frac{1}{2}(q^* - q)(p^* - p_S) = \frac{1}{2}(q^* - q)(p_D - p_S)$

[found it easier to start at end and go backwards...]

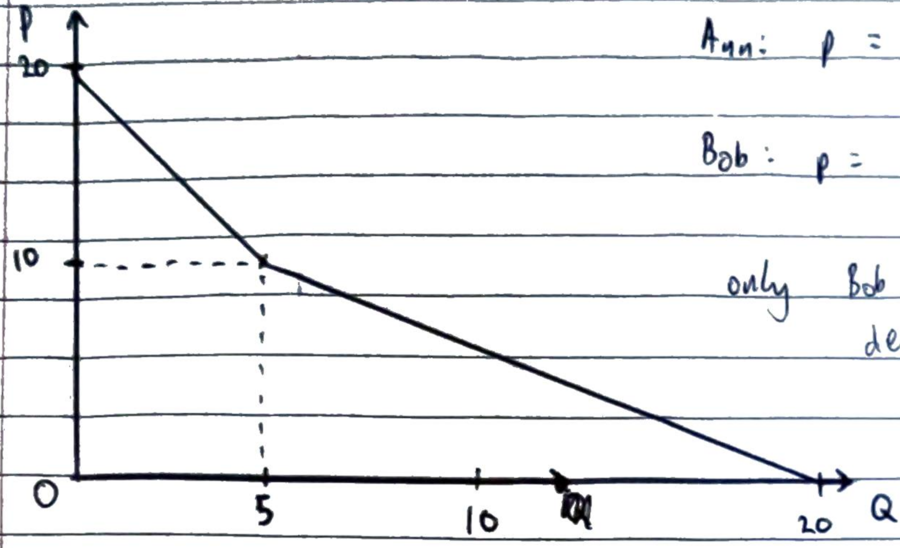
e) Incidence on consumers $C = \frac{1}{2}(20 - 18.75)(0.1125 - 0.1) =$ £0.007813 million

Incidence on producers $E = \frac{1}{2}(20 - 18.75)(0.1 - 0.09375) =$ £0.003906 million

So there is twice as much incidence on consumers as producers.

f) If $|\varepsilon|$ is greater, since p^* and q^* are fixed, $\frac{\Delta q}{\Delta p}$ is more negative i.e. inverse demand curve ~~steeper~~ shallower. ~~In the initial equilibrium~~, CS is ~~larger~~ less in the initial equilibrium, since $P_{resv.\,D}$ is ~~greater~~ smaller. PS unchanged. With VAT, there is more DWL and government raises less revenue than before, because demand is more sensitive to the higher price and so quantity falls by more than before. (oh, and the new p is not as high as the ~~previous~~ calculated p) → The incidence is greater on the relatively more inelastic side. i.e. $|\varepsilon_S|$ vs $|\varepsilon_D|$.

College 1.



Ann: $p = 10 - q_0^a$

Satiation $q_0^a = 10$

Bob: $p = 20 - 2q_0^b$

satiation $q_0^b = 10$

only Bob until $p \leq 10$, where he demands $q_0^b = 5$