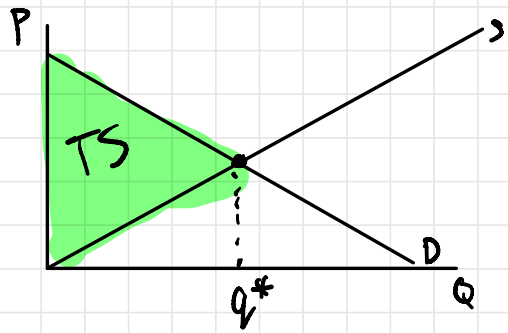
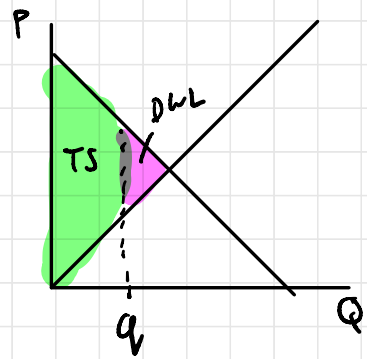
12-1-23

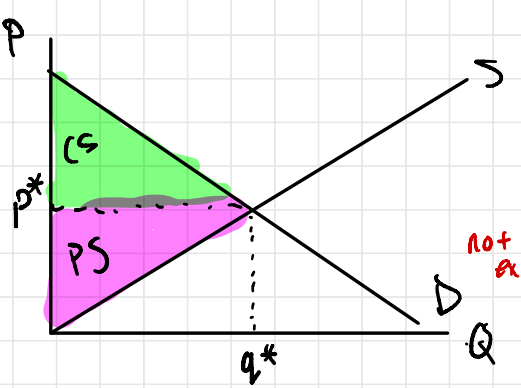
- Partial equilibrium - market for 1 good
  - measure welfare in dollars (total surplus)
  - welfare only depends on quantity





- Competitive equilibrium - an allocation (quantities) and prices such that
  1. given prices, consumers are maximizing utility
  2. given prices, producers maximizing profit
  3. markets clear (supply = demand)

- first welfare theorem: competitive eq'bm maximizes total welfare (assuming no externalities or market power)

- 

$$CS = WTP - P$$

$$= \int_0^{q^*} D^{-1}(q) - P^* dq$$

not on exam →

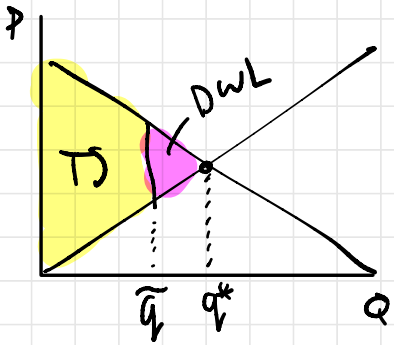
$$PS = P - WTR$$

$$= \int_0^{q^*} P^* - S^{-1}(q)\, dq$$

$TS = CS + PS \quad (+ GR)$

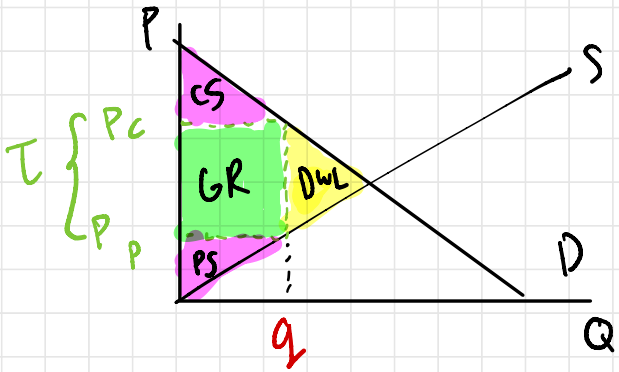
if Supply & demand linear - just use geometry!

- $\text{Deadweight loss}(\tilde{q}) = \max_q \{TS(q)\} - TS(\tilde{q})$



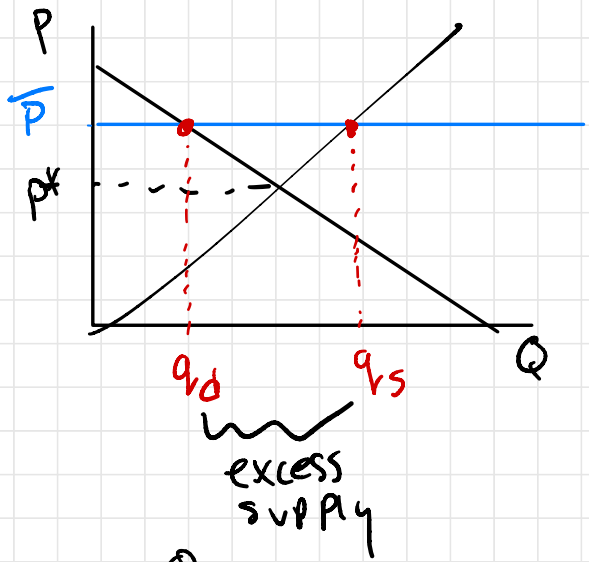
- taxes: drive a wedge between S & D

$P_p + T = P_c$



$D(P_c) = S(P_p)$

- Price controls - price floor or price ceiling



can be supported by gov't purchase of excess supply or deficiency payment (subsidy)

Practice Questions

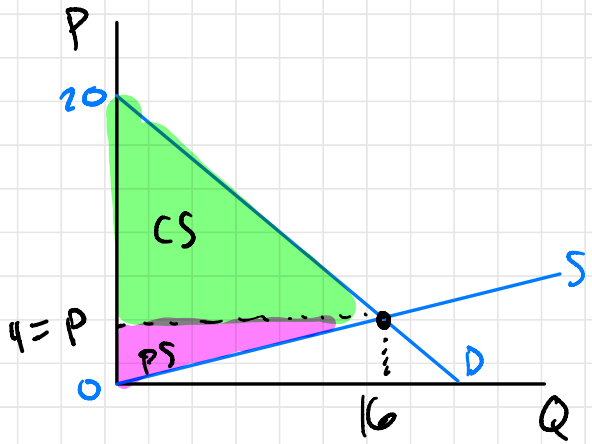
1. $D(p) = 20 - p$, $S(p) = 4p$

$D(p) = S(p)$

$20 - p = 4p \Rightarrow 5p = 20$

$\Rightarrow p = 4$

$\boxed{S(4) = 4 \cdot 4 = 16}$



inverse demand:

$q = 20 - p$

$\Rightarrow p = 20 - q$

$D^{-1}(q) = 20 - q$

$q = 4p$

$p = \frac{1}{4}q \Rightarrow S^{-1}(q) = \frac{1}{4}$

$CS = \frac{1}{2}\,16 \cdot 16 = \frac{1}{2} \cdot 256 = 128$

$PS = \frac{1}{2}\,16 \cdot 4 = 32$

$TS = CS + PS = 160$

2. $T = \$5$,

$P_p + 5 = P_c$

$D(P_c) = S(P_p)$

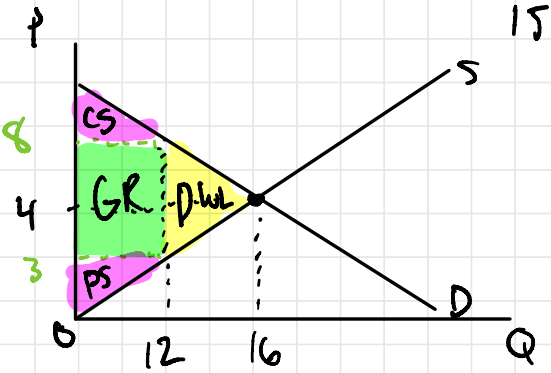
$20 - P_c = 4P_p$

$20 - (P_p + T) = 4P_p$

$15 = 5P_p \Rightarrow P_p = 3$

$P_c = 8$

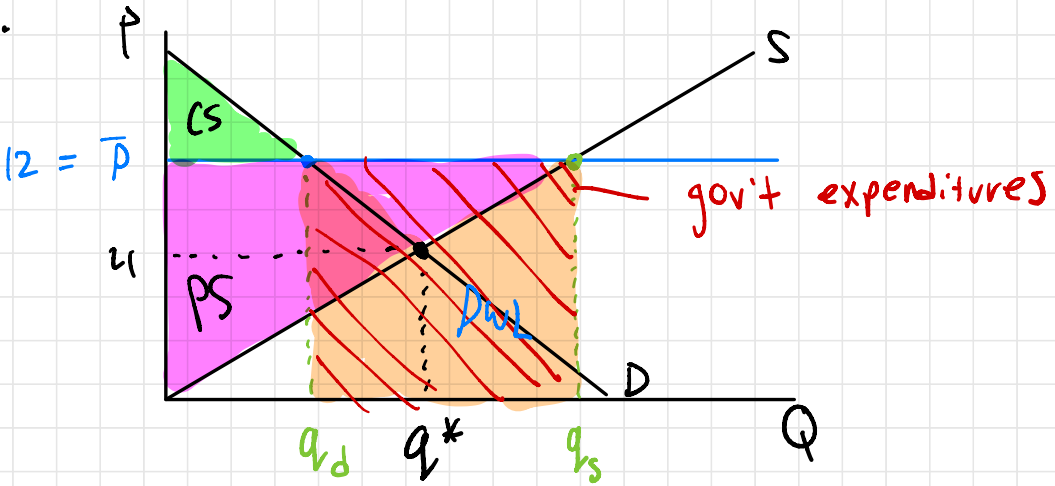
$D(P_c) = 20 - 8 = 12$

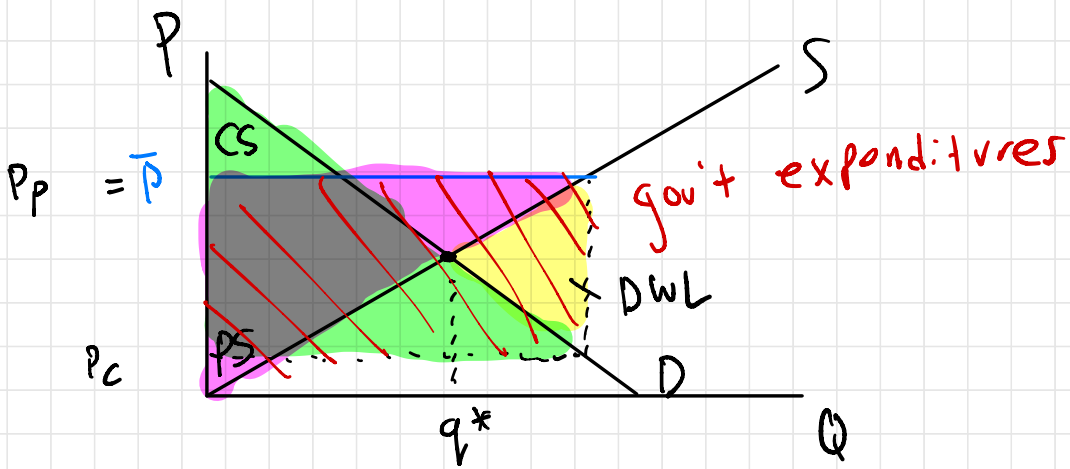


$GR = 12 \cdot 5 = 60$

$DWL = \frac{1}{2}\,5 \cdot 4 = 10$

3.





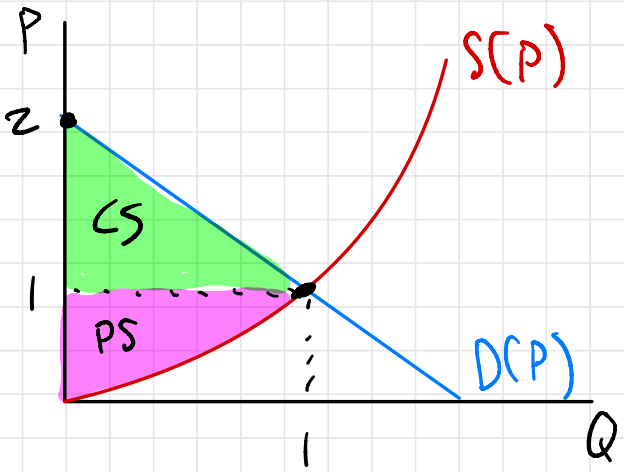
4. $D(p) = 2 - p$, $S(p) = \sqrt{p}$

$D(p) = S(p) \Rightarrow \sqrt{p} = 2 - p \Rightarrow p = 4 - 4p + p^2$

$\Rightarrow$ $p = 1$, ~~4~~ ↳ $\sqrt{4} \neq 2 - 4$

$p = 1 \Rightarrow D(1) = 2 - 1$

$\Rightarrow q = 1$



$CS = \frac{1}{2} \cdot 1 \cdot 1$

$= \frac{1}{2}$

$S^{-1}(q) = q^2$ ★ PS not a triangle

$$PS = \int_0^{q^*} p - S^{-1}(q)\, dq$$

$$= \int_0^1 1 - q^2\, dq$$

$$= [q]_0^1 - \left[\frac{q^3}{3}\right]_0^1$$

$$= 1 - \frac{1}{3} = \frac{2}{3}$$

Note: not required for exam