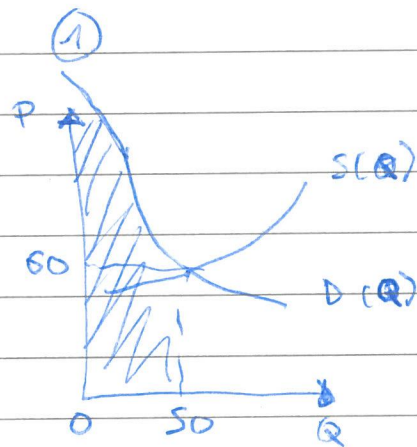


## • Compute Consumer Surplus:

This may be a frightening task, as we are dealing with integrals, but let's divide it into small steps:

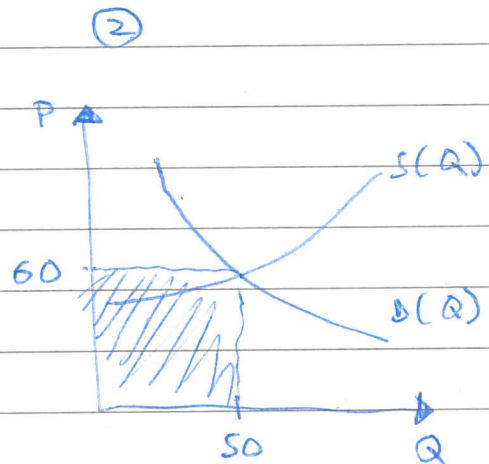
### Elements of Consumer Surplus:

- ① enters positively • All the utility consumers get from consuming  $Q^*$
- ② enters negatively • All the cost they have to ~~get~~ face to get  $Q^*$  units



$$\int_0^{50} D(Q) dQ$$

→ what they get in terms of utility by consuming  $Q^* = 50$



$$P \cdot Q = 60 \cdot 50 = 3000$$

→ what they have to spend to get  $Q^* = 50$  units of the good

• Now, let's compute ① →  $\int_0^{50} D(Q) dQ$

$$\int_0^{50} D(Q) dQ = \int_0^{50} \frac{6000}{Q+50} dQ \Rightarrow$$

→ As  $\frac{a}{b} = a \cdot \frac{1}{b}$ , we get:

$$\int_0^{50} 6000 \cdot \left( \frac{1}{Q+50} \right) dQ$$

→ As  $\int K \cdot x dx = K \cdot \int x dx$  (where  $K$  is a constant), we get:

$$6000 \int_0^{50} \left( \frac{1}{Q+50} \right) dQ$$