The equations below are the demand and supply curves.

$$Q_S = 400p - 100 \; ; \; Q_D = 1100 - 200p$$

Tax (amount collected) → tax*quantitiy

consumer surplus → upper triangle

producer surplus → lower triangle

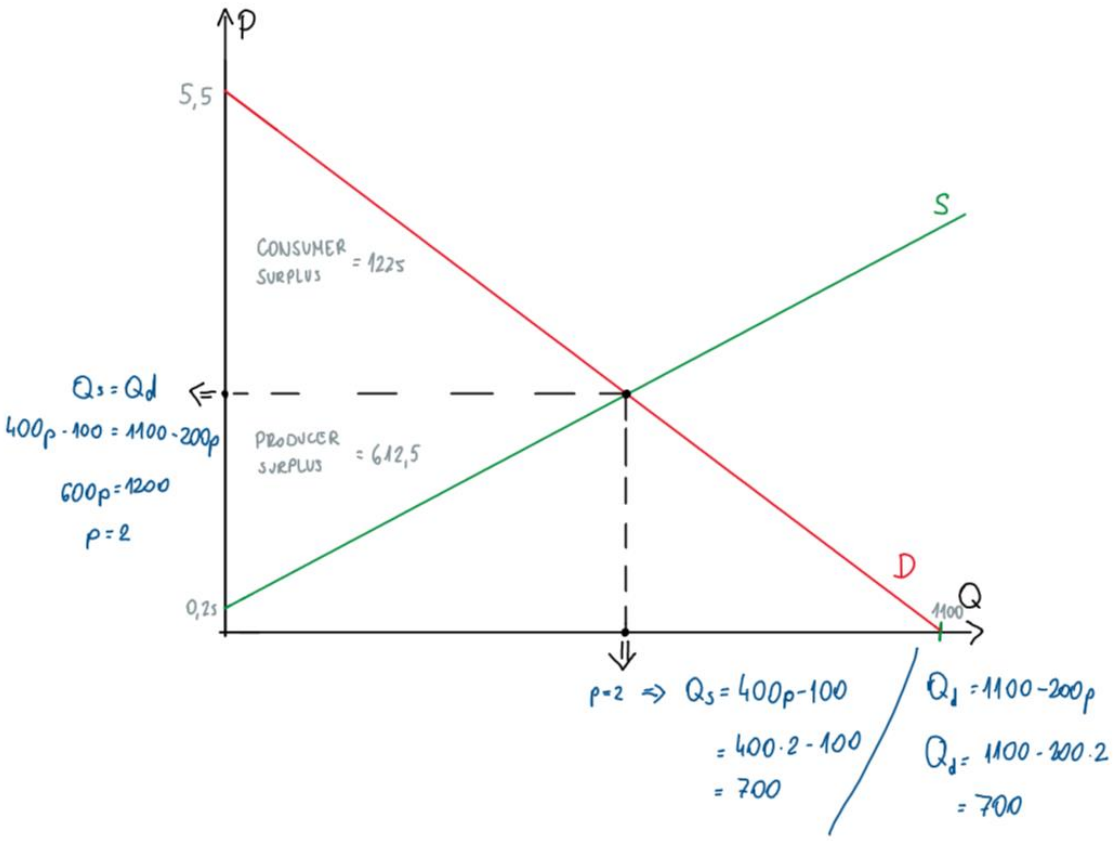
Total surplus: sum of consumer & producer surplus and the amount of the tax

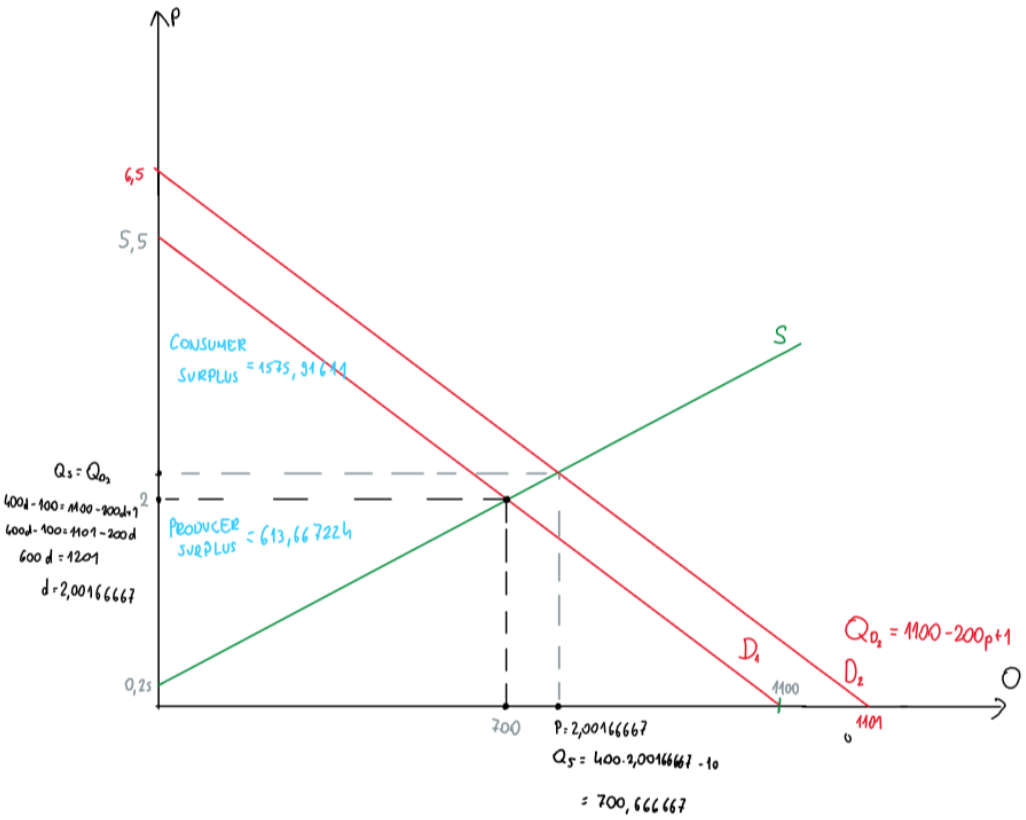
deadweight loss: the surplus difference with and without taxation

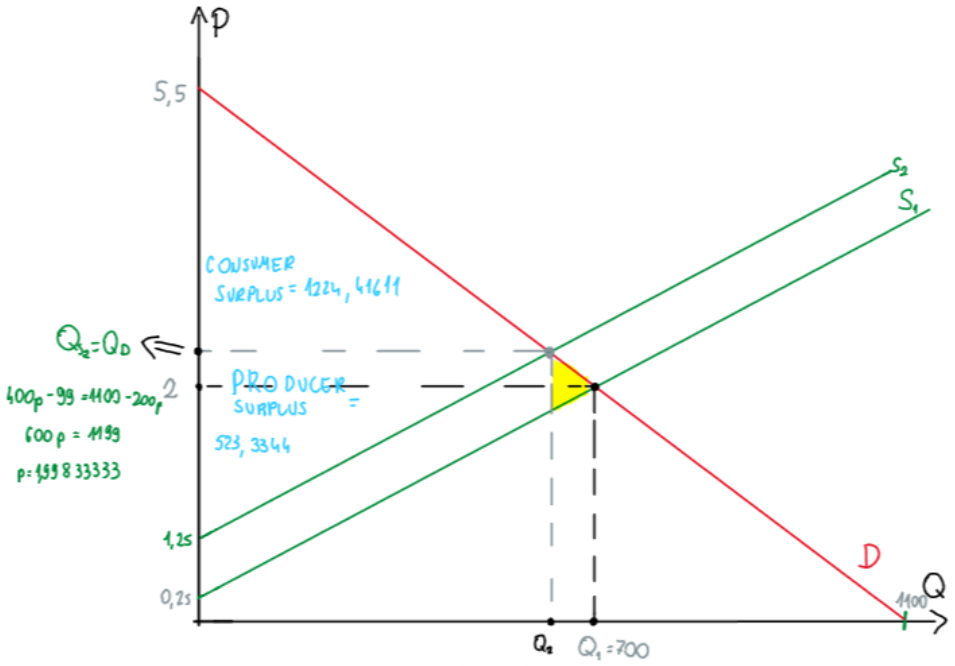
1) Compute the equilibrium quantity, price, surplus(distinguishing between producer and consumer surplus).
    i. Q=700
    ii. P=2
    iii. Producer surplus=1225
    iv. Consumer surplus=612,5
    v. Total surplus= 1225+612,5=1837,5
2) Suppose that we tax the demand side, the consumer pays 1 euro more. Compute the equilibrium quantity, price, surplus, and deadweight loss.
    i. Q=700,666667
    ii. P=2,00166667
    iii. Tax (amount collected)= 700,666667
    iv. Producer surplus=613,667224
    v. Consumer surplus=1575,91611
    vi. Total surplus=2890,25
    vii. Deadweigh loss=1052,75
3) Suppose we tax the supply side instead, the producer pays 1 euro. Compute the equilibrium quantity price, surplus, and deadweight loss. Comment.
    i. Q=699,333333
    ii. P=1,99833333
    iii. Tax (amount collected)= 699,333333
    iv. Producer surplus=523,3344
    v. Consumer surplus=1224,41611

vi. Total surplus=2447,084

vii. Deadweigh loss=609,5838




P
6,5
5,5
CONSUMER SURPLUS = 1575,91611
S
$Q_s = Q_{D_2}$
400d - 100 = 1100 - 200d + 1
600d - 100 = 1101 - 200d
600d = 1201
d = 2,00166667
2
PRODUCER SURPLUS = 613,667224
$Q_{D_2} = 1100 - 200p + 1$
D_1
D_2
0,25
1100
O
700
P = 2,00166667
$Q_S = 400 \cdot 2,00166667 - 10$
= 700,666667
1101
0



$400p - 99 = 1100 - 200p$

$600p = 1199$

$p = 1,998\,33333$

$p = 1,998333333$

$Q_3 = 400 \cdot 1,998333333 - 100$

$= 699,333333$