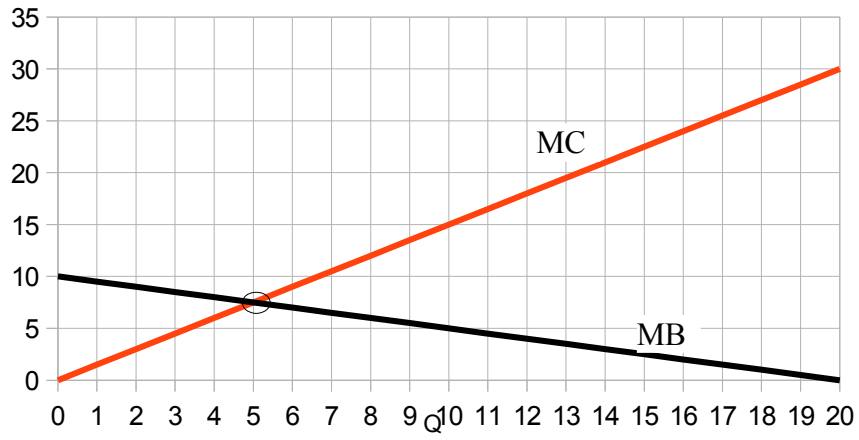
Solutions to Assignment 2

1.



a. Q=5 (socially optimal)

b. Q = 0

c. Q = 20

d. 7.5 = 10-0.5*Q Q=5

e. Q = 5
Resort would accept area under MC curve (up to Q=5) = 75/4 (minimum)
Paper would paid area under MB curve (up to Q=5) = 175/4

2.
a. A subsidy can be used if the resort owns the property rights to the lake.
A production quota can be used if the paper mill owns the property rights.
Any solution that internalizes the value of the externality would work.

b. tax revenue = 7.5*5 = 75/2
The tax internalizes the externality cost of water pollution

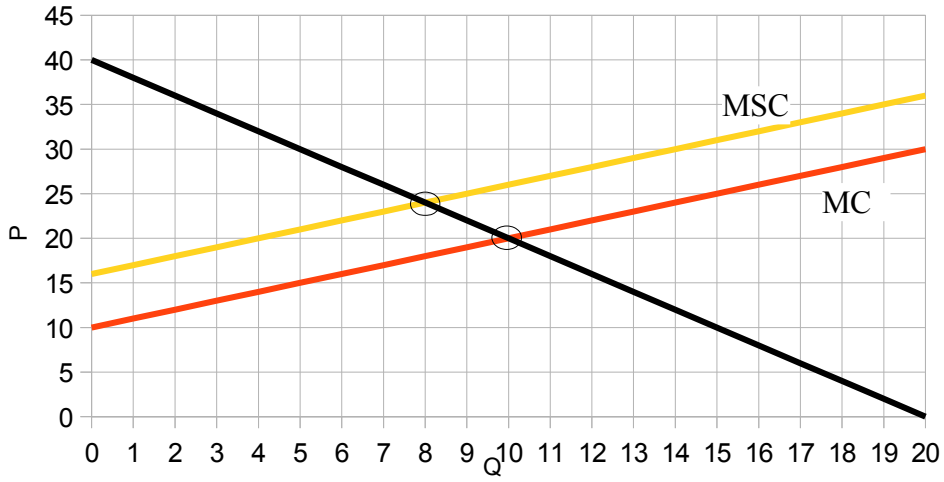
c. The paper mill is willing to pay more than the minimum the resort is willing to receive to drive water use to Q=5. Beyond that point, the additional marginal payment that the mill is willing to do is less than the marginal payment the resort is willing to receive.
In c, the resort would receive a payment and be properly compensated by the water pollution. In b, the government will receive the payment from the mill (in the form of tax) and keep the compensation for water pollution.

3.

a. net savings are adjusted by three variables: (1) education expenditure; (2) depletion of natural resources; and (3) pollution damages.
b. because it also considers accumulation and depletion of human and natural capital (in addition to physical capital).

c. Such country would be showing positive accumulation of physical capital when in truth its capital stocks, considering human and natural resources, would be declining. This could give a misleading impression that the country's growth is sustainable.

4.



a. MC = 10 + Q = P = 40 – 2Q
solve for Q = 10 and P = 20

b. MSC = 16 + Q = P = 40 – 2Q
solve for Q = 8

c. The total value of the externality is the area between the MC and MSC curves, up to the production point.
At the original equilibrium (P=20,Q=10), the area is: 6*10 = 60
At the socially optimal point (Q=8) is: 6*8 = 48

d. A tax of $6 per raft would generate the Q=8 equilibrium.
the change is externality is 60-48 = +12 (i)
The loss in consumer and producer surpluses is: -54 (ii)
Tax revenues: +48 (iii)
The net gain to society is (i) + (ii) +(iii): +6

5.
a. P = MC = 10 + 1.5*Q
solve for Q = 60

b. P = MC = 40 + 1.5*Q
solve for Q = 40

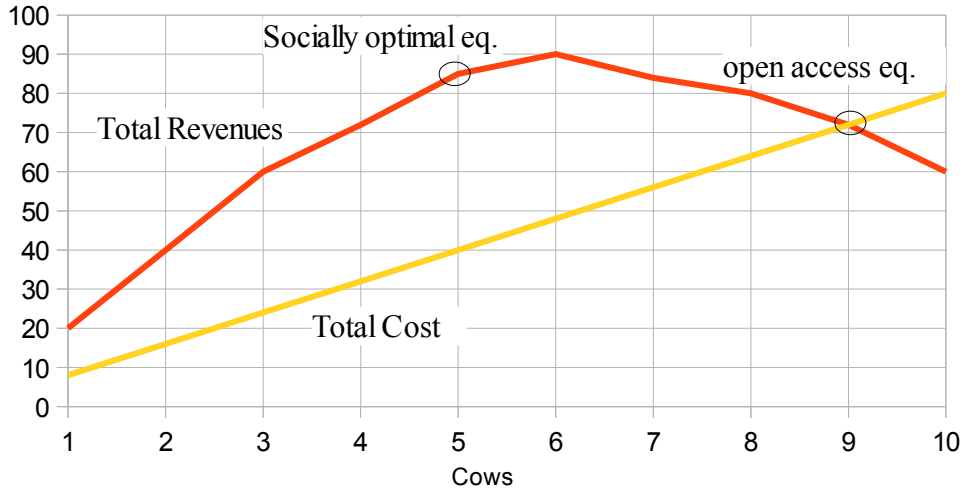
c. Total cost to the firm is the change in profits:
BEFORE REGULATION:
Revenues P*Q: 100*60 = 6000
Costs (area under the MC curve): 3300
Profits = 2700

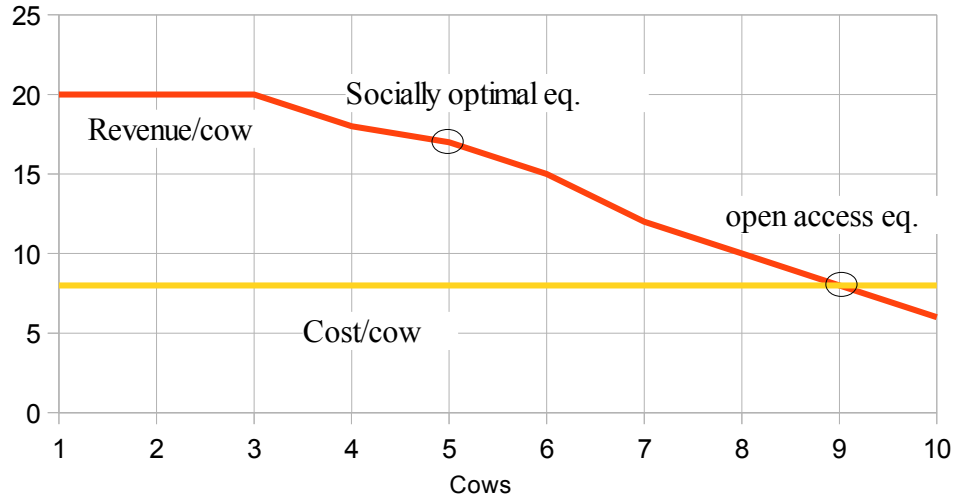
AFTER REGULATION:
Revenues P*Q: 100*40 = 4000
Costs (area under the MC curve): 2800
Profits = 1200

change in profits is: -1500

d. tax of $30/barrel

6.





a. socially optimal: 5 cows (maximum total profit)
open access: 9 cows (total profit = zero).

b. The farmers that leave their cows out of the meadow should receive a subsidy that should higher than $7/cow and less than $9/cow

c. Open access outcome brings profits = 0
Socially optimal outcome brings profits = 45
Net gain is: $45