Problem 1

Petra is a member of a tennis club.
She can rent a court for $p_t = 50$ CZK per hour.
The members also pay a yearly membership fee.
Petra's income is $m = 300{,}000$ CZK per year.
She consumes t hours of tennis and y CZK of other goods.
Her utility function is $u(t, y) = 100t - t^2/4 + y$.

a) What is the maximum yearly fee Petra is willing to pay?
b) What is the maximum fee that the club could ask if $p_t = 0$?
Would the club be financially better off this way?

Problem 2

Demand for the concert of U2 is $q(p) = 200{,}000 - 1{,}000p$.
The organizer has a stadium with 120,000 seats.

a) What is the price that maximizes the revenue of the organizer? What is the price elasticity of demand and marginal revenue at this price?
b) How does the answer change if the concert takes place in a stadium with only 60,000 seats?

Problem 3

The demand function is $q(p) = 250 - 2p$.
The supply function is $q(p) = 2 + 6p$.
There is a price ceiling of 25 CZK in the market.

What is the subsidy at which the demand is satified?

Problem 4

In this problem, we study the market for tinned meat.
The demand function is $q(p) = 150 - 2{,}5p$.
The supply function is $q(p) = 10p$.
There is a 100% ad valorem tax in the market.

a) What is the equilibrium quantity and the demand and supply price?
b) How does the answer change if, instead of the 100% tax, each person is obliged to send one tin to refugee camps for each tin she consumes?