## GENERAL EQUILIBRIUM - ROBINSON CRUSOE'S ECONOMY

## Problem \#3

Find the ratio of (competitive) equilibrium prices for goods $x$ and $y$ that provide for efficiency of consumption and production, when the production possibilities frontier is: $x^{2}+4 y^{2}=200$ and the utility function is: $U=(x y)^{0.5}$. Determine the produced (consumed) amount of goods $x$ and $y$ in this case.

## Problem \#4

Robinson Crusoe decided that he will spend exactly 8 hours per day searching for food. He can spend this time looking for coconuts or fishing. He is able to catch 1 fish or find 2 coconuts in 1 hour.
a) Find the formula for Robinson's production possibilities frontier.
b) Robinson's utility function is $U(F, C)=F C$, where $F$ is his daily consumption of fish and $C-$ of coconuts. How many fish will Robinson catch and how many coconuts will he find?
c) One day a native inhabitant of another island arrived on Robinson's island. On this other island catching a fish takes 1 hour and finding a coconut - 2 hours. The visitor offered trade at an exchange rate that operates on his island, however Robinson will have to give him 1 fish as a fee for bringing him back to his island. Will Robinson profit from this trade? If yes, will he be buying fish and selling coconuts or vice versa?
d) A few days later a native inhabitant of a different island arrived. On his island catching a fish takes 4 hours and finding a coconut - 1 hour. He offered Robinson trade at an exchange rate that operates on his (i.e. the native's) island but demanded 2 fish from Robinson for bringing him back to his island. If Robinson decides to trade with this island, in production of what will he specialize?
e) How will Robinson's consumption possibilities change in both cases? Which situation will be more profitable for him? (Do not forget about the transportation fee!)

## Problem \#5

On the Veritas island it is illegal to trade with other countries. Only 2 goods are consumed on this island: milk and wheat. There are 40 farms in the northern part of the island. The production possibilities frontier in the north takes the form: $m=60-6 w$, while in the south it is: $m=40-2 w$, where $m$ is the amount of milk and $w$ - the amount of wheat. The economy remains in a competitive equilibrium and 1 unit of wheat is exchanged for 4 units of milk.
a) At the given equilibrium prices, in the production of which good will the northern and southern farms specialize?
b) Friendly Vikings discovered the possibility to trade with Veritas and offered exchange of wheat for milk at a rate: 1 unit of wheat for 3 units of milk. If the Veritas island permits free trade with the Vikings, a new price ratio will appear on the island. How will production (output) of the farmers in the north and in the south change?
c) The Veritas Council of the Elderly is to decide whether to accept the Vikings' offer. The Council members from the north have 40 votes and the ones from the south - 60. Assuming that each of them votes in accordance with the interest of their part of the island, how will the farmers from the north and south vote? Why are you able to provide a specific answer to the latter question not knowing anything about the consumption preferences of the farmers?
Assume that instead of the offered exchange rate of 1 unit of wheat for 3 units of milk the Vikings offered trade at a rate of 1 unit of wheat per 1 unit of milk. How will the output of the farmers from the north and from the south change? How will they now vote?

