Hw4p1

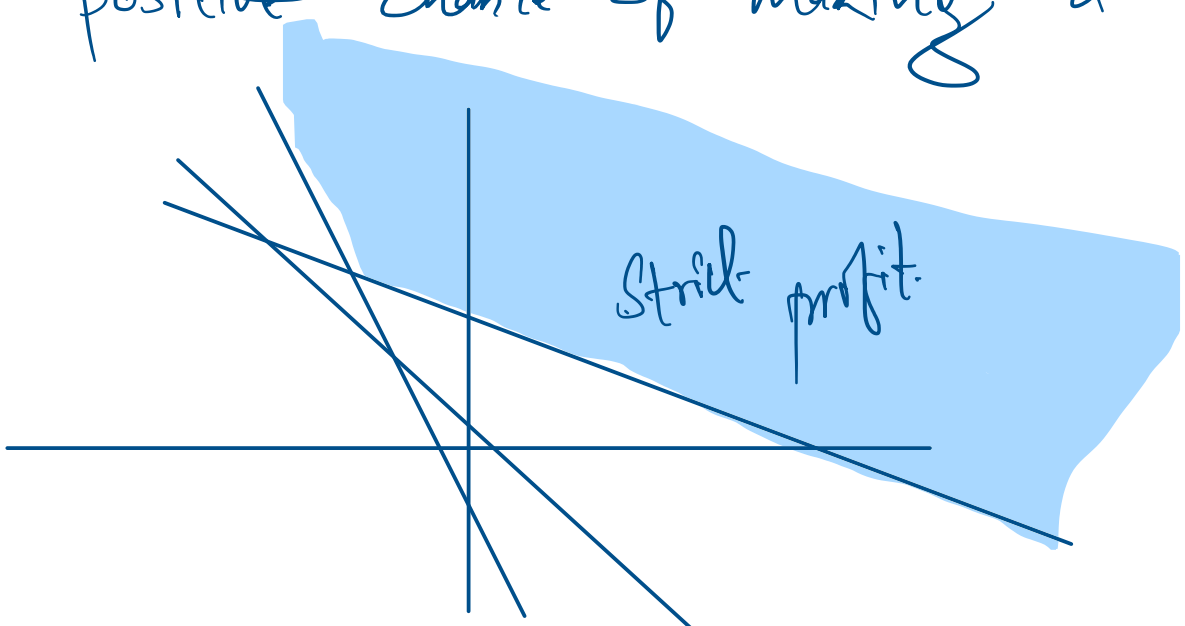
Tuesday, 18. October 2022 19:14

H.W 4. (Stochastic Methods Lab)

Problem 1.

Generally, the answer to the given question is No.

If the stock price has three possible values at time T, then at any point when the seller of the option has no risk of making a loss, s/he strictly has a positive chance of making a profit.



In order to be guaranteed to meet the claim at time T, the seller requires a condition that lies in the shaded region. But any such case ensures strict profit to the setter. And any situation outside the shaded region ensures strict loss.

Thus, this results in the situation where there is no portfolio that replicates this situation and there is no 'unique' fair price for the option.

Thus, the similar analysis would not work for models with three possible values in future.

But In case of American Options might be yes.
Contrary to the binary model, this type of models would work only when they would incorporate a third possible value which would be the "zero-change" in value over a time period.

Acc. to investopedia, this type of models are more relevant to real life situations, as it is possible that the value of the underlying asset may not change over a time period, such as a month or a year.

This kind of model with three possible values are useful when pricing American Options and Embedded Options!