

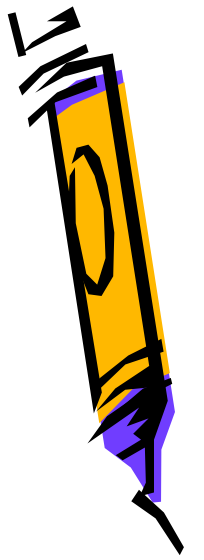
Problem 1

Give a formula for the smallest σ -algebra with respect to which a given mapping X is measurable



Problem 2

State the Radon-Nikodým theorem



Problem 4

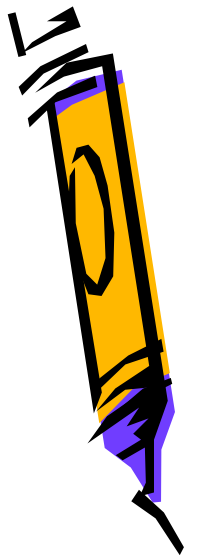
Define the following concepts

(a) Filtration

(b) adapted

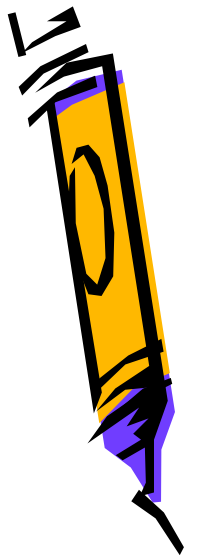
(c) Martingale

(d) Supermartingale



Problem 5

When is a measure called risk neutral?

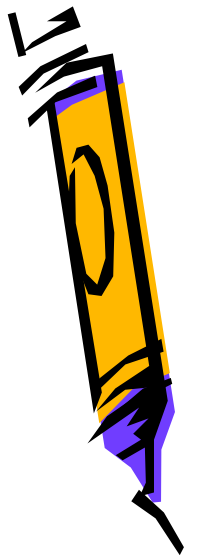


Problem 6

(a) What is a simple European derivative security?

(b) What is the value (at time 0) of an sEds in terms of the risk-neutral measure?

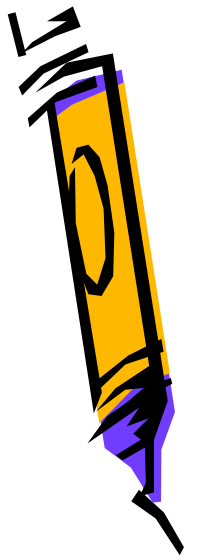
(c) What is the value (at time 0) of an sEds in terms of the actual measure?



Problem 7

Define the following processes for sEds

- Portfolio process
- Wealth process
- Value process

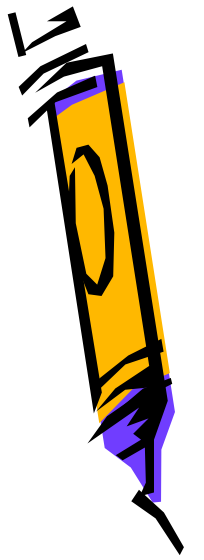


Problem 9

State the following theorems

(a) Doob's stopping time principle

(b) Doob's optional sampling theorem

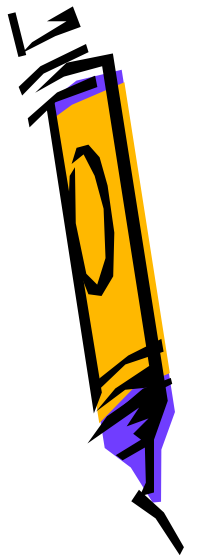


Problem 10

(a) What is the Snell envelope?

(b) State the optimal stopping problem.

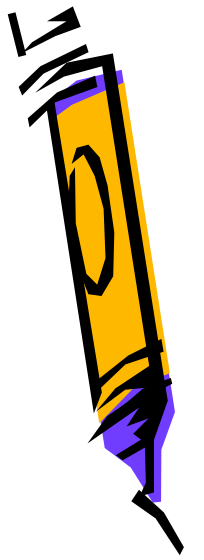
(c) Give a solution to the optimal stopping problem.



Problem 11

(a) What is the Doob decomposition?

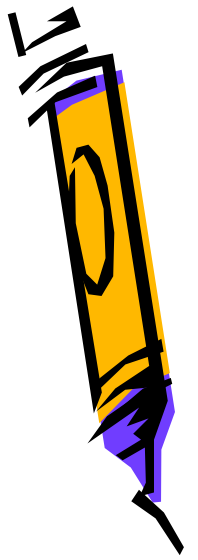
(b) Give the largest optimal stopping time.



Problem 12

(a) What is an American derivative security?

(b) What is the value (at time 0) of an Ads in terms of the risk-neutral measure?



Problem 14

Is it true that the discounted wealth process of an Ads always is a martingale?

