MATH 6: HANDOUT 11
MONTY-HALL PROBLEM.

Monty Hall problem

Suppose you're on a game show, and you're given the choice of three doors: Behind one door is a car; behind the others, goats. You pick a door, say No. 1, and the host, who knows what's behind the doors, opens another door, say No. 3, which has a goat. He then says to you, "Do you want to pick door No. 2?"

Is it to your advantage to switch your choice?

Answer: yes!

Let us see what happens if you have chosen door No. 1. Then there are the following possibilities:

Car is behind door..	Probability	It is better to
1	1/3	stay
2	1/3	switch
3	1/3	switch

Thus, switching wins with probability 2/3.

Here is one more problem of a similar sort.

Exchange paradox (or two-envelope problem)

You are given two indistinguishable envelopes, each of which contains some amount of money. It is known that one envelope contains 10 times as much as the other. You pick one envelope at random; it is opened and you see that it contains $50. Now you are given a choice: do you want to keep this money — or do you want to take the other envelope instead?