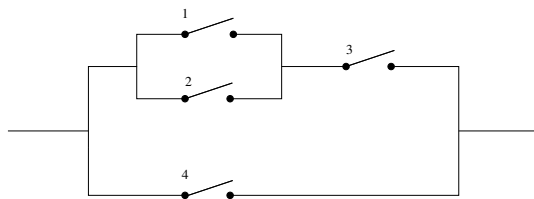


## Math 302 Assignment 1

This assignment is due at the beginning of class on Wednesday, September 21.

1. You ask 3 randomly chosen people their birthdays.
  - (a) What is the sample space for this experiment?
  - (b) What is the probability that they all have the same birthday?
2. In Lotto 6/49 six numbered balls are drawn from a drum of 49 such balls. Prior to the draw you had select 6 numbers from 1 to 49. You win \$10 if you chose exactly 3 of the drawn numbers correctly. Find  $P(\text{you win the \$10 prize})$ .
3. How many fair dice do you need to roll if you want the probability of rolling at least one 6 to be more than  $1/2$ ?
4. The letters of ABRACADABRA are rearranged at random. Find the probability they still spell ABRACADABRA. Justify your answer carefully. [See example 3d on page 4.]
5. Consider the following circuit with four switches labelled 1, 2, 3, 4 which are either “on” (current can flow through it) or “off”. Current flows through the circuit from left to right if there is a path with all switches “on”.
  - (a) Assume a fair coin is tossed 4 times and switch  $i$  is on iff the  $i$ th toss is a H. Find the probability that current flows through the circuit.
  - (b) Assume instead that a fair coin is tossed two times and switch 1 is on if HH occurs, switch 2 is on if HT occurs, switch 3 is on if TH occurs, and switch 4 is on if TT occurs. Find the probability that current flows through the circuit.



Here are some practice problems not to be handed in. You should try them before the first Midterm:  
Ch. 1 p. 16-17 #10 (a,c,e), 12, 21  
Ch. 2. p. 50-54 # 2, 5, 8, 10, 15(a,b), 23, 25.