

## Mth 21, Homework 8 on section 3.4

Due by Wed, Nov 8.

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Please use lots of space and explain your answers, showing clearly any work you had to do. Each question is worth 3 points.

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- (1) Find the probability that in a group of 7 random people, 2 have the same birthday. Use these steps:
    - (a) The experiment is asking 7 people their birthdays. Find  $n(S)$ , the size of the sample space of possible answers.
    - (b) Let  $E$  be the event that 2 or more share the same birthday. Let  $E'$  be the complementary event that all 7 have different birthdays. Compute  $n(E')$  using the counting principle.
    - (c) Find  $p(E')$ .
    - (d) Find  $p(E)$ , which is the answer we are looking for.(Hint: you should get  $p(E)$  close to 5%.)
  - (2) A lottery uses numbers 1 to 50. In the weekly draw, six numbers are picked.
    - (a) Find the probability that the six numbers on your ticket match and you win the grand prize.
    - (b) Find the probability that five of your numbers match.
  - (3) Suppose you are dealt 4 cards from the pack of 52. The order is not important. How many 4 card combinations are possible?  
(Hint: it's more than 200 000.)
  - (4) You are dealt a five card poker hand. What is the probability of getting the 2, 3, 4, 5 and 6 of clubs?
  - (5) You are dealt a five card poker hand. What is the probability of getting any five clubs?
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If you get stuck on a question or aren't sure if you understand it:

- Go over the relevant class notes and section in the textbook.
- Check if you get the right answer for a similar odd-numbered question in the textbook (answers at the back of the book).
- Ask me about it after class.
- Come to my office hours: Mon 11:30 - 12:30, Wed 11:30 - 12:30 in CP 317.
- Go to the Math Tutorial Lab in-person in CP 303 or online.