

Mth 21, Homework 7 on section 3.3

Due by Wed, Nov 1.

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

- (1) Two dice are rolled. Let E be the event that sum of the numbers is 5 or less. Let F be the event that you roll a double (both dice the same number).
 - (a) What is $n(S)$, the size of the sample space here?
 - (b) Compute $p(E)$, the probability of E happening, using the key formula $p(E) = n(E)/n(S)$.
 - (c) Compute $p(F)$ the same way.
- (2) Let E' be the event that E in question 1 does not happen (called the complementary event). Use a rule of probability to compute $p(E')$.
- (3) For the events E and F in question 1 find
 - (a) $p(E \cap F)$ which means both events happening together,
 - (b) $p(E \cup F)$ which means either event happening or both.(Hint: you can use a rule of probability to compute part (b).)
- (4) Suppose the probability of winning prize X in a raffle draw is 0.3 and the probability of winning prize Y is 0.2. Also the probability of winning both is 0.1. Find the probability that you win prize X or prize Y.
- (5) A pack of cards is shuffled and you pick a card. Let E be the event that you pick a heart. Let F be the event that you pick a club.
 - (a) What is $n(S)$, the size of the sample space here?
 - (b) Compute $p(E)$.
 - (c) Compute $p(F)$.
 - (d) Compute $p(E \cap F)$. Are these events *mutually exclusive*?
 - (e) Compute $p(E \cup F)$, the probability of picking a heart or a club.

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.