HW 3. DUE WEDNESDAY JULY 11 IN CLASS

MATH 170A SUMMER 2018

No late HW is accepted. I must have your HW before I leave the classroom on Wednesday.

The material for problems 4, 5(c), 6(b) will be introduced in Monday's lecture. This material is covered in sections 2.3 and 2.4 of the book.

(1) Supplementary problems Chapter 1 problem 25.
(2) Supplementary problems Chapter 1 problem 34. (For a similar example, see problem 49 from Chapter 1.)
(3) Supplementary problems Chapter 1 problem 36. (This one is similar to example 1.32 in the textbook, on page 50.)
(4) Supplementary problems Chapter 2 problem 4.
(5) A friend offers to play three games with you. Each game uses a coin that comes up heads with probability p, and in each game you win if the coin comes up heads.
    - In game (A): if you win then you get \$1; if you lose then you give up \$1.
    - In game (B): if you win then you get \$1; if you lose then you give up \$2.
    - In game (C): if you win then you get \$3; if you lose then you give up \$1.

    (a) Using the sample space $\Omega = \{Heads, Tails\}$, define random variables X_A, X_B, and X_C that describe the games (A), (B), (C), respectively.
    (b) Find the probability mass functions of X_A, X_B, and X_C.
    (c) Find the expectations of X_A, X_B, and X_C.
(6) You are rummaging through a giant pile of socks. 75% of the socks you pick up have holes in them (independently of the others you have picked up).
    (a) You stop rummaging when you pick up a sock with no hole. Let X be the number of socks you picked up. Find the probability mass function of X.
    (b) On a different day, you stop rummaging either when you have picked up a sock with no hole or once you have picked up five socks, whichever happens first. Let Y be the number of socks you picked up. Find the probability mass function of Y. Find the expectation of Y.

Supplementary problems: http://www.athenasc.com/CH1-prob-supp.pdf, http://www.athenasc.com/CH2-prob-supp.pdf