

HW 2. 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>