EE 381 Homework 2 - Part 1

This homework is due with additional parts in dropbox (beginning of laboratory section) on 2-22-2021.

The sample space for an experiment has three outcomes, all equally likely:

$S = \{(1, 2, 0), (2, 1, 3), (4, 1, 1)\}$.

Define the random variable (RV)

$Y = Y(s) = Y(a, b, c) = a + b + c$.

Find the probability mass function of Y.

From, Larsen & Marx page: 111

A radar unit tracks a target which may use interference. If the target does not employ interference, then during one surveillance cycle the unit may detect it with probability p_0; if it employs interference, then the unit may detect it with probability $p_1 < p_0$. The probability that the interference will be used in one cycle is p and does not depend on the way and time the interference was used in the other cycles. Find the probability that the target will be detected at least once in n surveillance cycles.

One of the numbers 1, 2, or 3 is selected at random. Then a fair coin is flipped that number of times. What is the probability that the number 3 was selected given no heads on the coin flips?

From, Solomon page: 67