Probability & Statistics.

Test 1 Retake. May 20, 2020

Problem 1 (15 minutes)

A symmetric coin is flipped until we get a series of tails – heads – tails. What is the probability that the coin will be flipped

(a) exactly 6 times;

(b) exactly 7 times?

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Problem 2 (15 minutes)

There are 10 white, 11 black and 12 purple balls in the urn. An experiment consists in taking a random ball out of the urn, noting its colour, and putting it back into the urn.

After 15 experiments black has been noted twice, white has been noted 9 times, and purple 4 times. What is the probability that the first three balls noted were white?

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Problem 3 (20 minutes)

Ten people enter the lift at the ground floor of a nine-storey building (i.e. there are ground, 1st, ..., 8th floors).
Find the expected value of number of people who

(a) exit at the fifth floor;

(b) do not exit at the fourth floor;

(c) exit after the third floor (i.e. on the 4th floor or higher).

Problem 4 (10 minutes)

Let us consider 15-digit numbers such that their digits follow in a non-decreasing order. One of such numbers is chosen at random. Determine the probability that all 10 different digits are used in writing down this number.