

Section 9/21

1 Question 4.1

At rush hour, passengers in a subway station come down an escalator to the platforms and choose either the Eastbound or the Westbound platform. Assume that each passenger chooses the Eastbound platform with chance 0.8 independently of all other passengers.

Suppose you start watching the escalator at the start of rush hour.

a) Find the chance that the first passenger to choose the Westbound platform is the fifth passenger that you see.

b) Find the chance that more than 15 passengers choose the Eastbound platform before the first one who chooses the Westbound platform.

2 Question 4.3

In a population, 30% of the individuals are green and the rest are blue. Suppose you draw individuals at random with replacement till both colors have appeared. Find the chance that you draw 10 times.

3 Question 4.10

Suppose you are running independent success/failure trials with probability 0.7 of success on each trial. Find the chance that you get 10 failures before the 15th success.

4 4.5

Cards are dealt one by one at random without replacement till the fourth ace appears. Let X be the number of cards dealt.

a) Find $P(X = 39)$.

b) Find $P(X > 20)$.