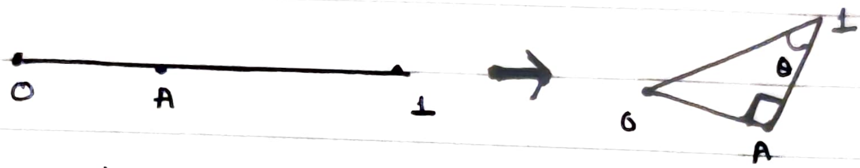
1. let $S = \{1, 2, 3 \ldots n\}$
f be a bijective function from S to S
If $f(i) = i$ we call it a fixed point.
If we select a random f from the set of all bijective functions from S to S what if expeted no. of fixed points and variance for the same.

2. Let two random variables X and Y and CDF F_X and F_Y ; find CDF of $Z = \min(X, Y)$

3. You are given an Urn with 100 balls (50 black, 50 white), You start picking balls one by one, until ~~the~~ all the balls are all out. What is the expected no. of colour switches you will encounter while radomly picking the balls.

(4) You are given a Box with 6 coupons, ~~and~~ labelled 1, 2, 3 ... 6. You are picking one by one with replacement. What is the ~~xpe~~ expected no. of tries you will need to get all the different coupons. Try to solve for general n coupons.

(5)



A point A is choosen at random on a rod of length 1. The rod is bent at A to form a Right angle triangle. If θ is the smallest angle of the triangle, what is the expected value of $\tan\theta$

(6) Two people visit a park between 5-6 pm each arrives at a random time ~~between~~ between 5-6 pm. ~~without~~ and stays for 30 min. in the park. What is the probability that they will meet each other.

7* let $X \sim N(0,1)$ [Natural $(1,0)$]
~~thepro~~ then prove that $X^2 \sim$ gamma $(1/2, 1/2)$

8 $X \sim N(\mu, \sigma^2)$

find $E(e^{xt})$