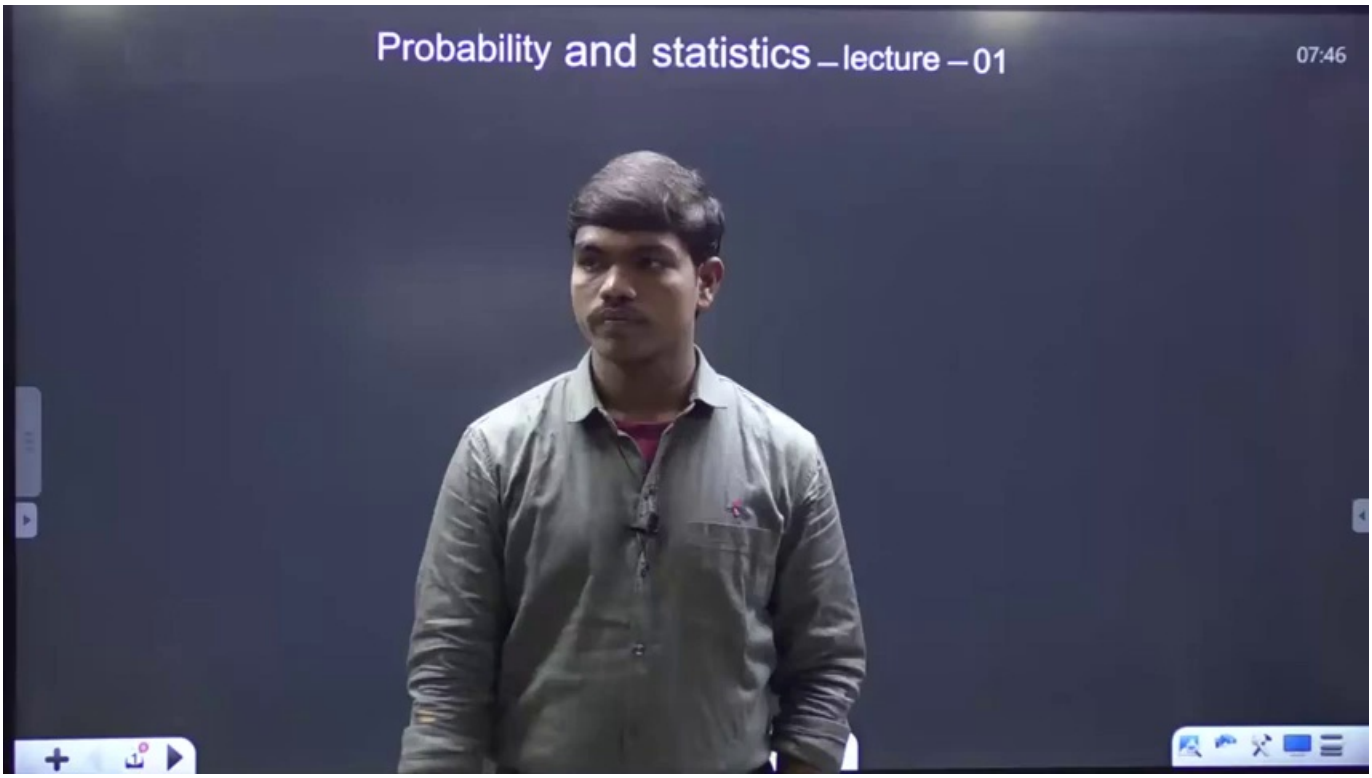
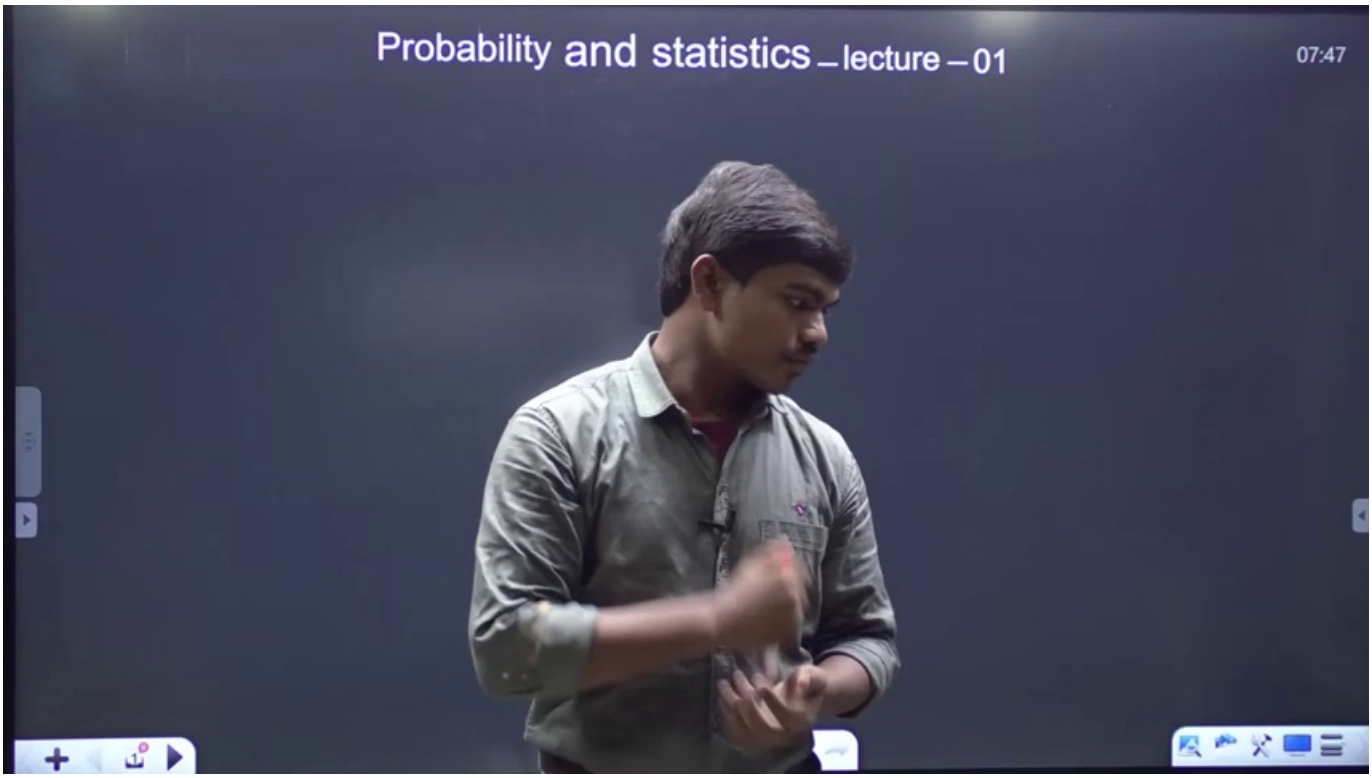


okay yeah so good morning all of you I welcome you all to this first lecture on

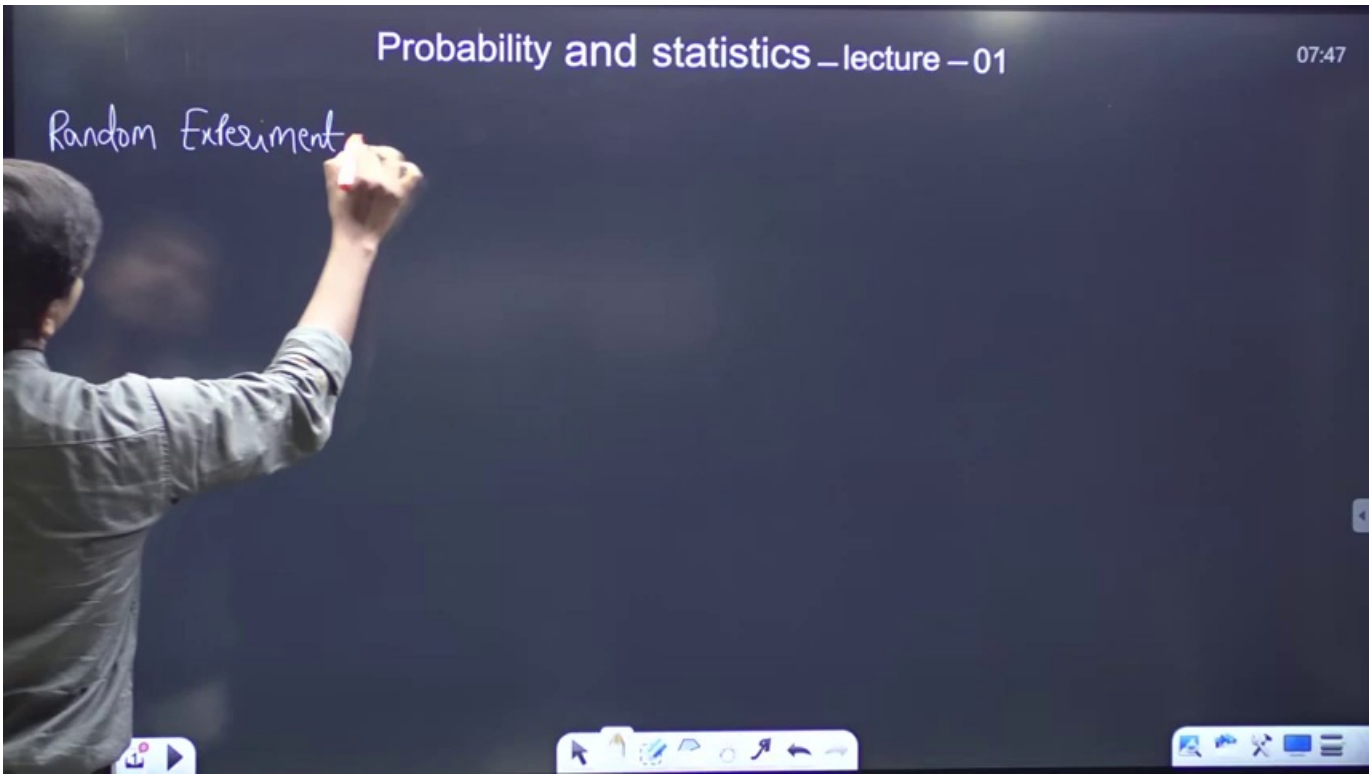
probability and statistics so am i audible to you at the first so am i



audible to you okay so will whoever is not the face today's class so we'll

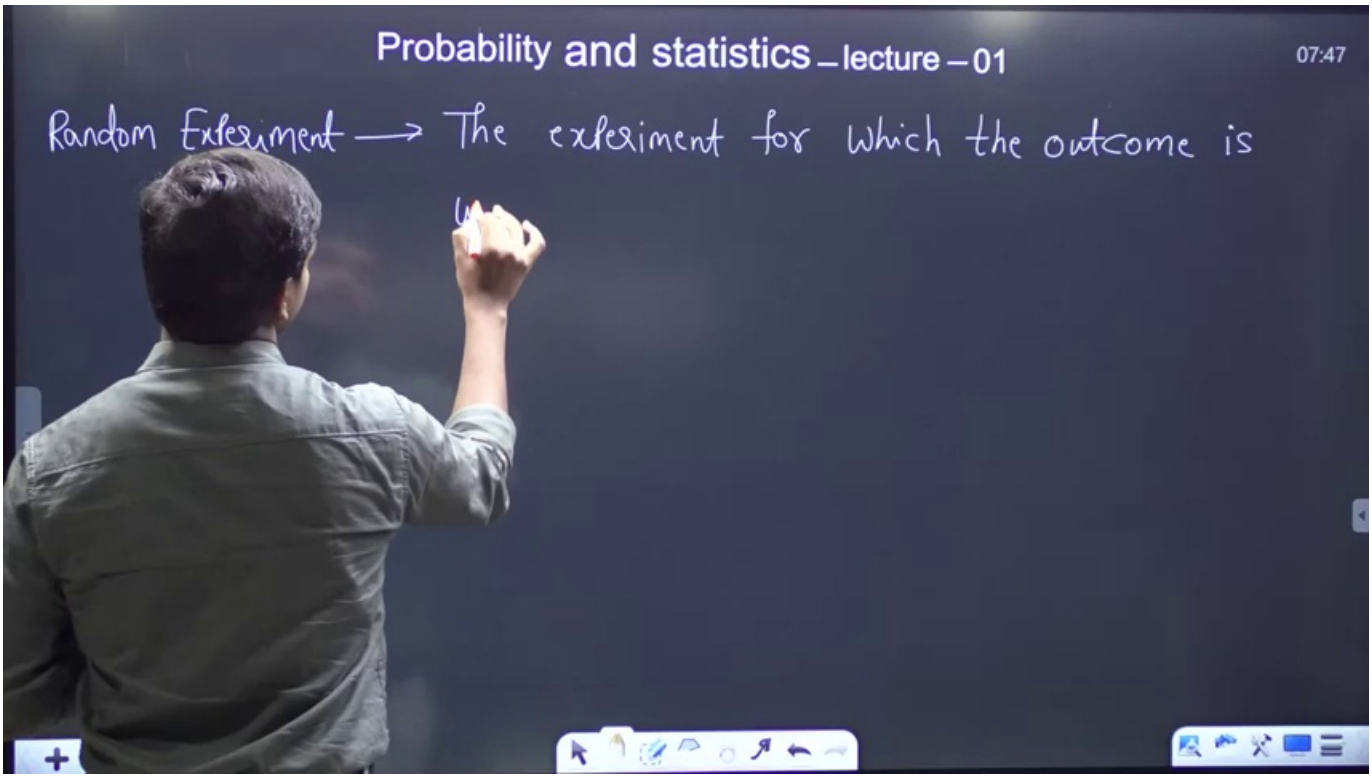
quickly go through the things so I have defined what is a random experiment for

you cut so what is a random experiment



the experiment good morning all of you so the experiment four ways for which

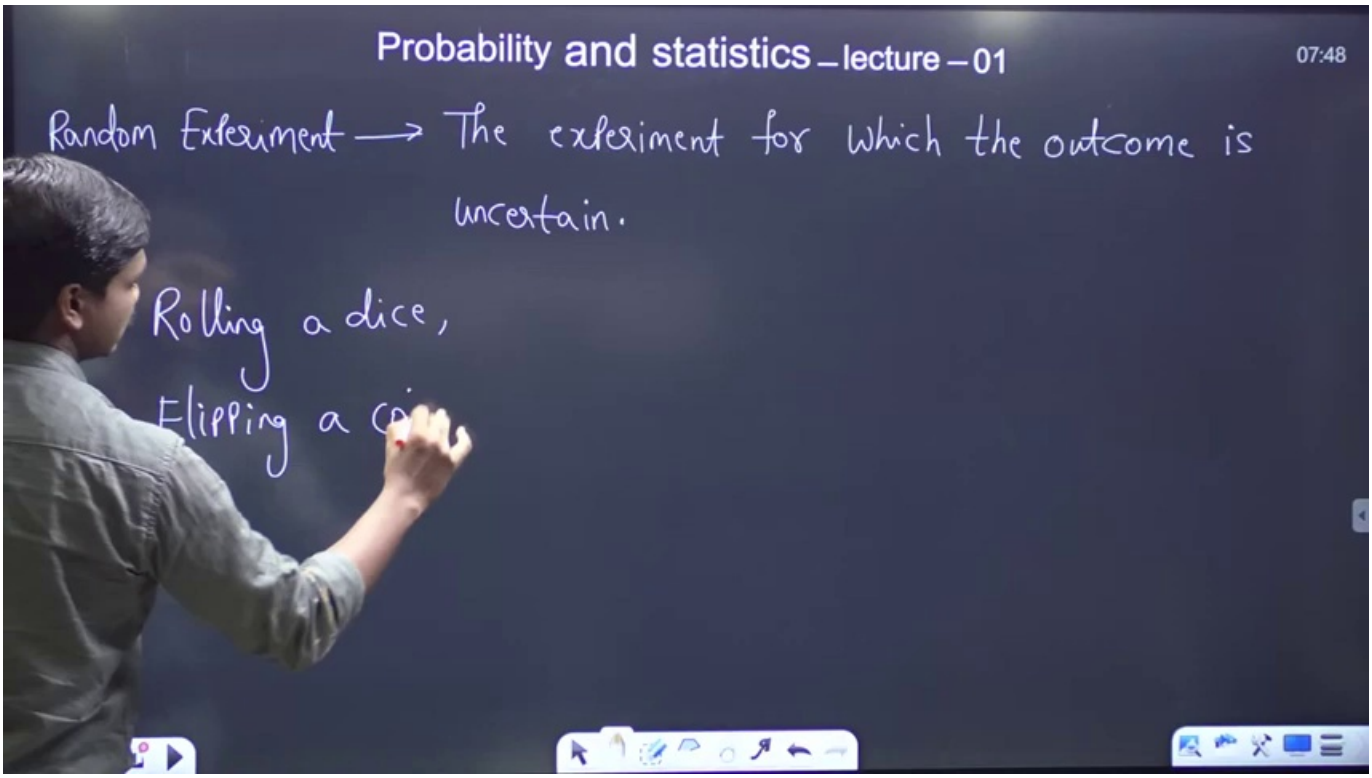
the outcome is uncertain this is what we have seen in Esther days for us in the



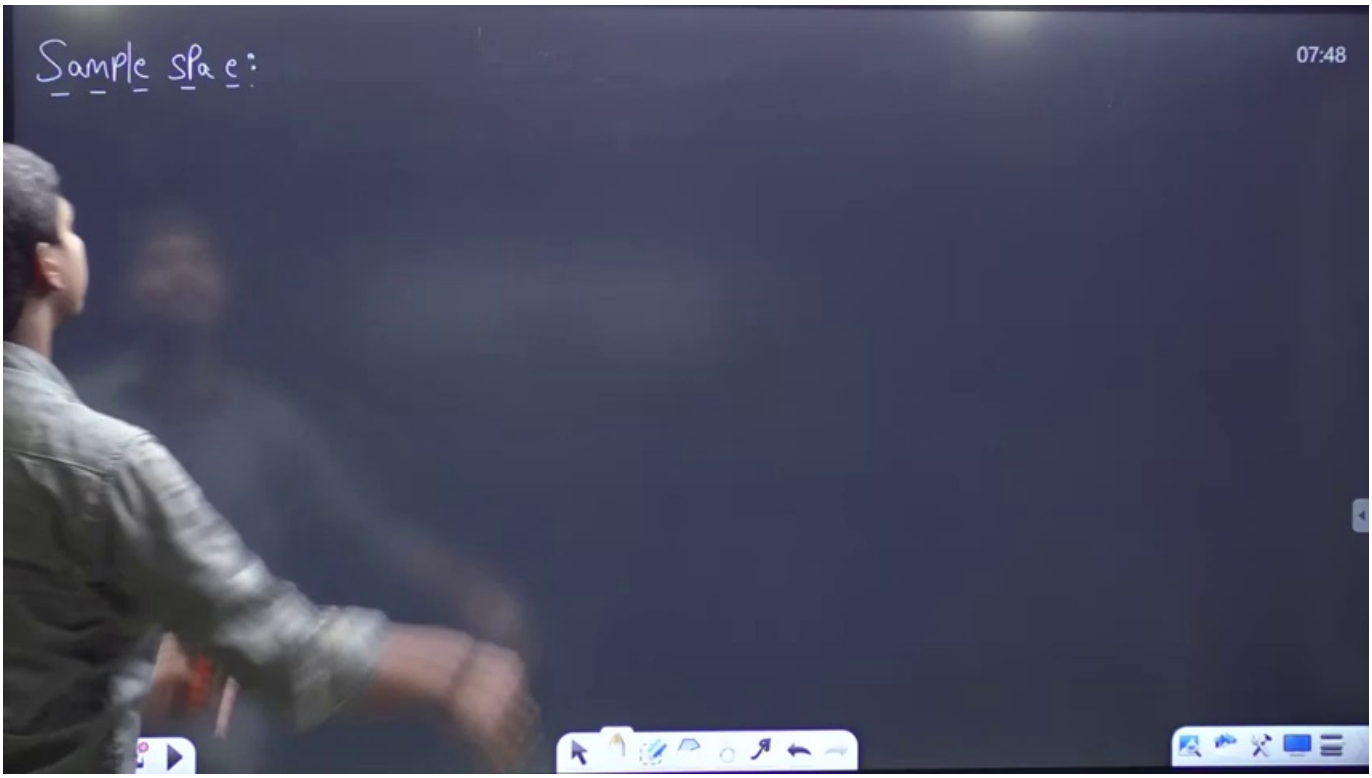
last five minutes so far which the outcome is uncertain

so examples if you see you know rolling a die and then flipping a coin you know

you can keep on writing as many nber



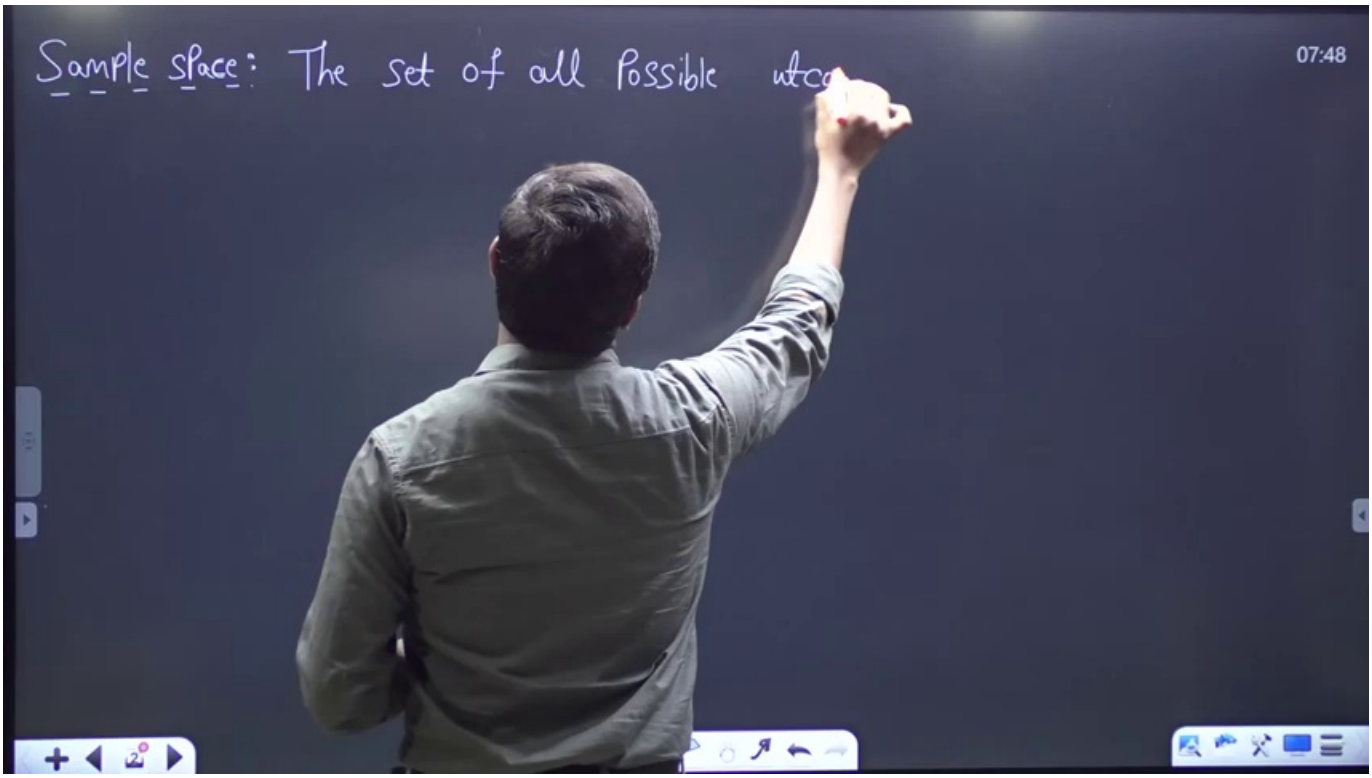
of examples as you could wish to do okay so in yesterday's class we have seen our different examples and we have talked about few more things as well so next we would like to define something called sample space which I have also defined in s today's class so I am just quickly calling the things that we discussed yesterday so that you will be having a



clearer idea if someone is not present for today's class so sample space is the

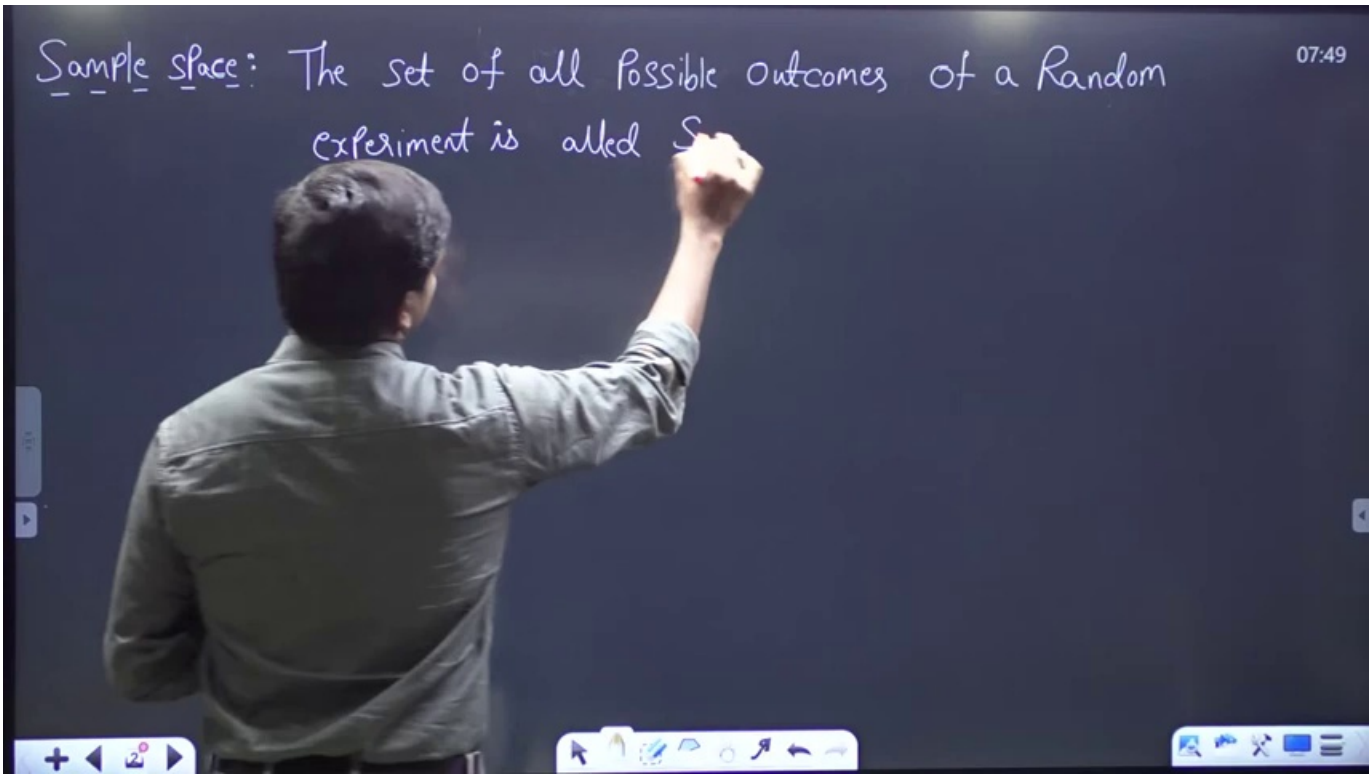
set of all cost what happened to this board again this a second guys the set

of all possible outcomes the set of all



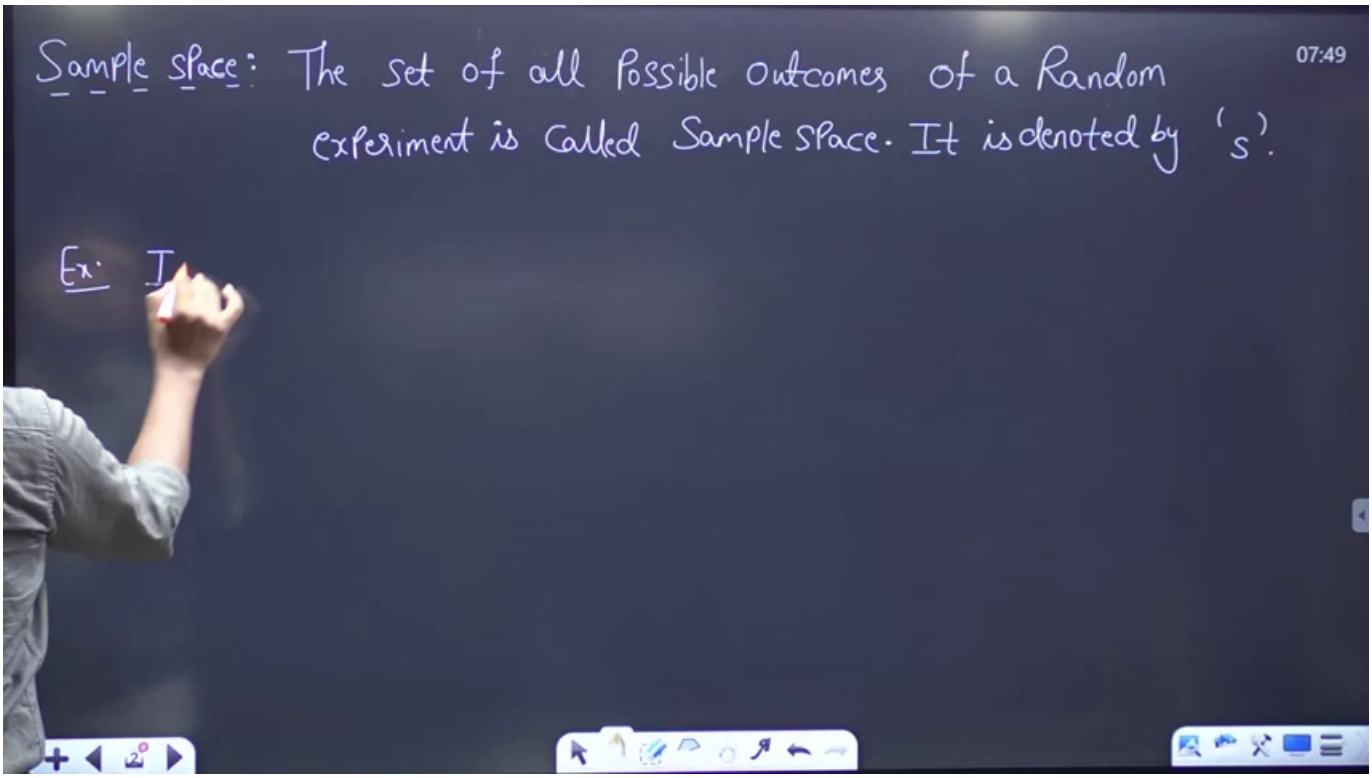
possible outcomes of a random experiment the set of all possible outcomes of a

experiment is called is called sample



space is called sample space it is denoted by it is denoted by yes that so

now if it is denoted by s so for example if random experiment is flipping a coin



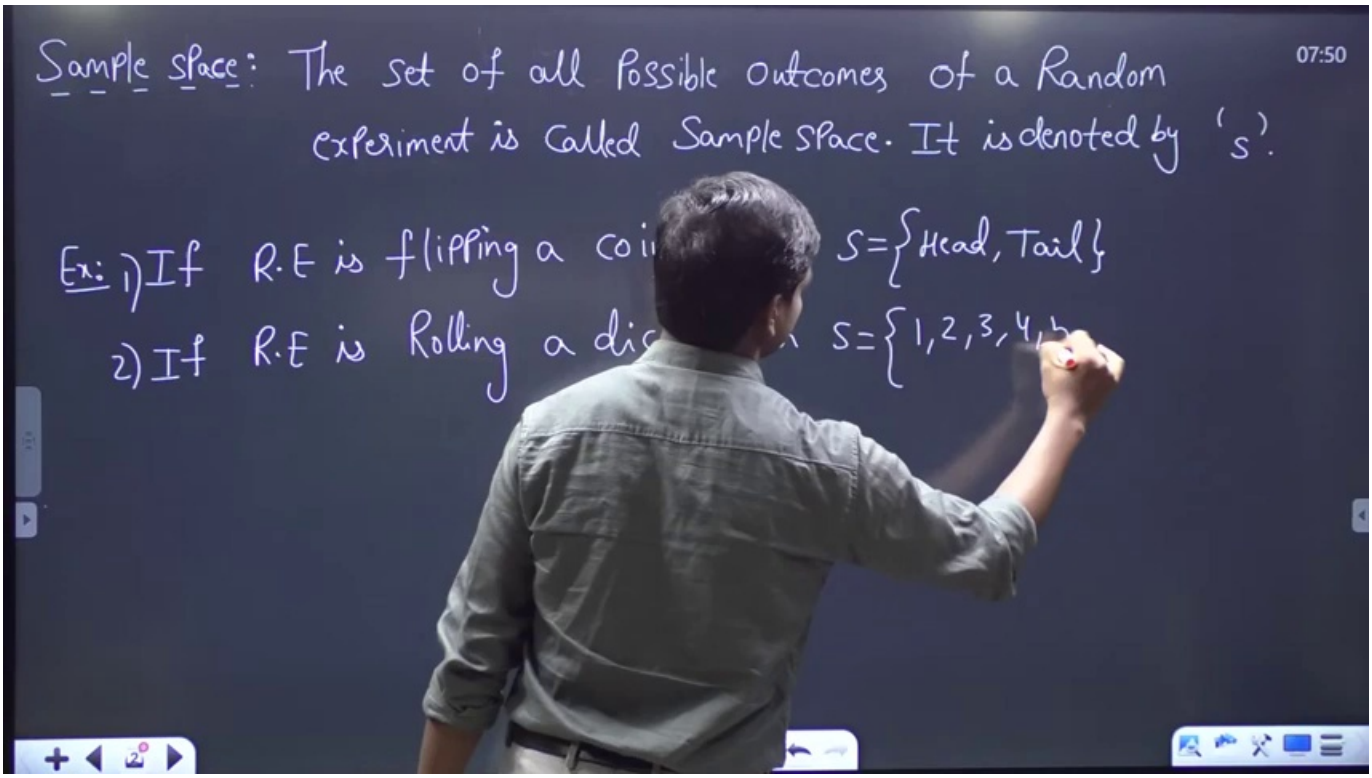
I am just quickly writing the things that we discussed yesterday so if the

random exponent is within the file then yes is equal to set off head comma tail

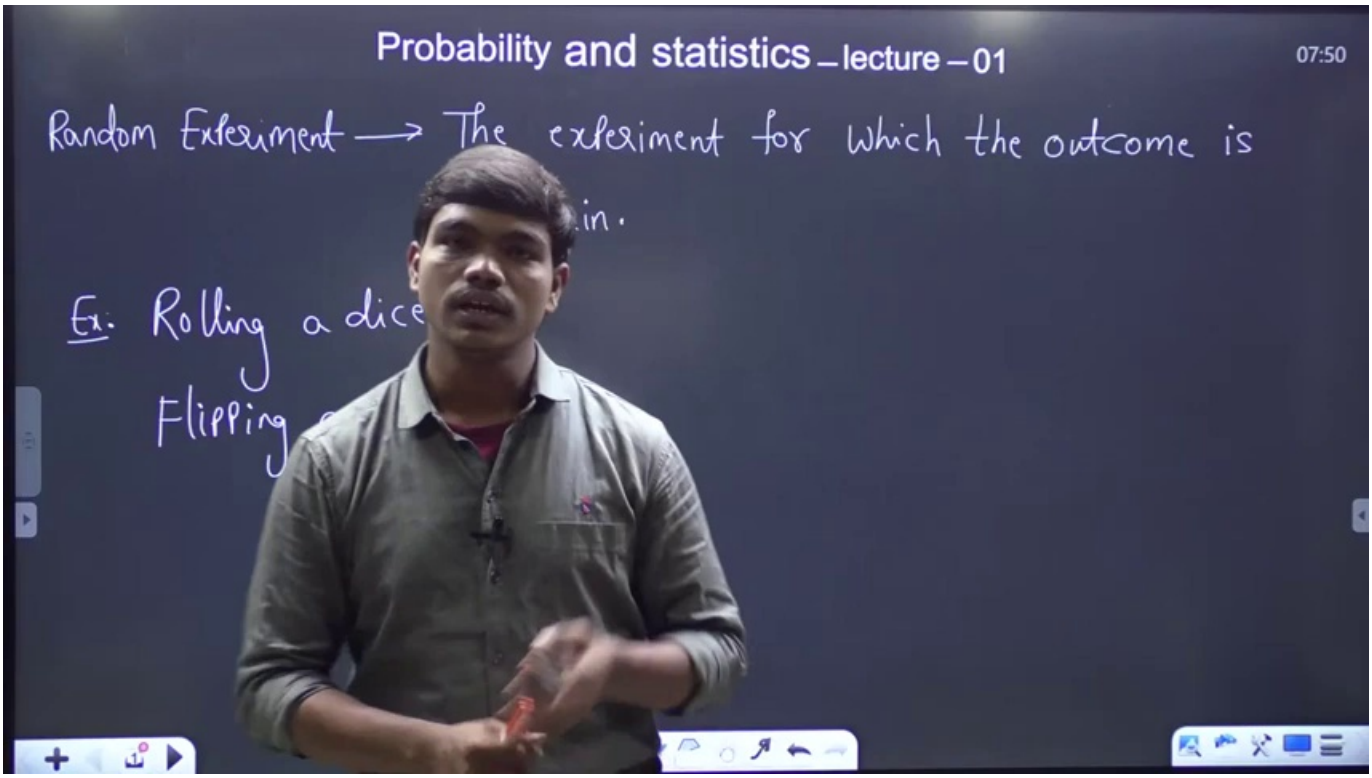
okay I you know with the I think we guess we wrote one more thing if vandamm

experiment is you know rolling it dice rolling a dice then yes is equal to 1 2

3 4 5 6 okay of course this is the case



when you are running a single die when you are holding multiple dice we have other you know other things as well because when you hold two dice there are two possible outcomes in every set cut so whoever is not present is today's class so if you keep we play you call we have discussed what is a random experiment so a random experiment is basically a experiment in which the



outcome is uncertain means in a particular trial of the experiment you

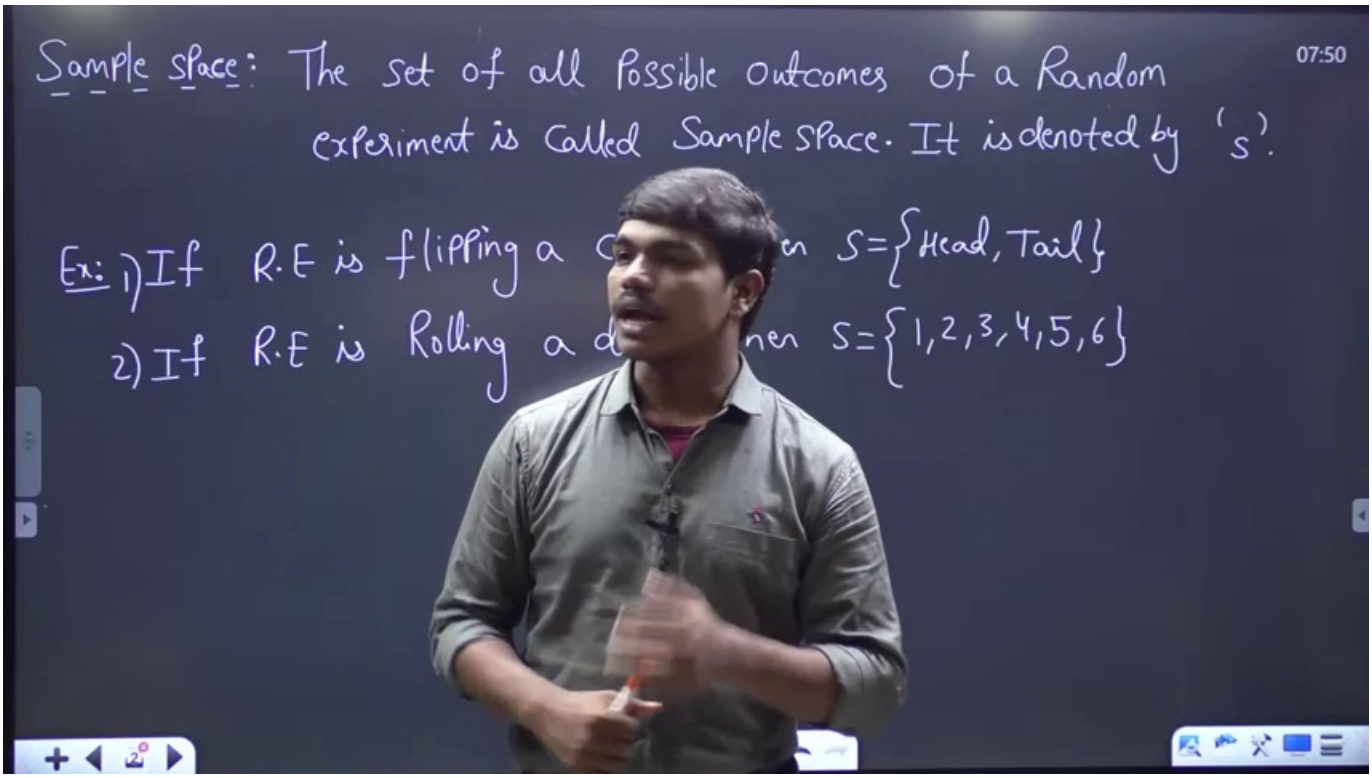
are not sure about which particular outcome is going to come but you know

whatever all possible outcomes of a particular random experiment cut and

that's why we say the outcome is uncertain and these are two examples we

have discussed two more cases in yesterday's class so I hope you remember

them so sample space so sample space is



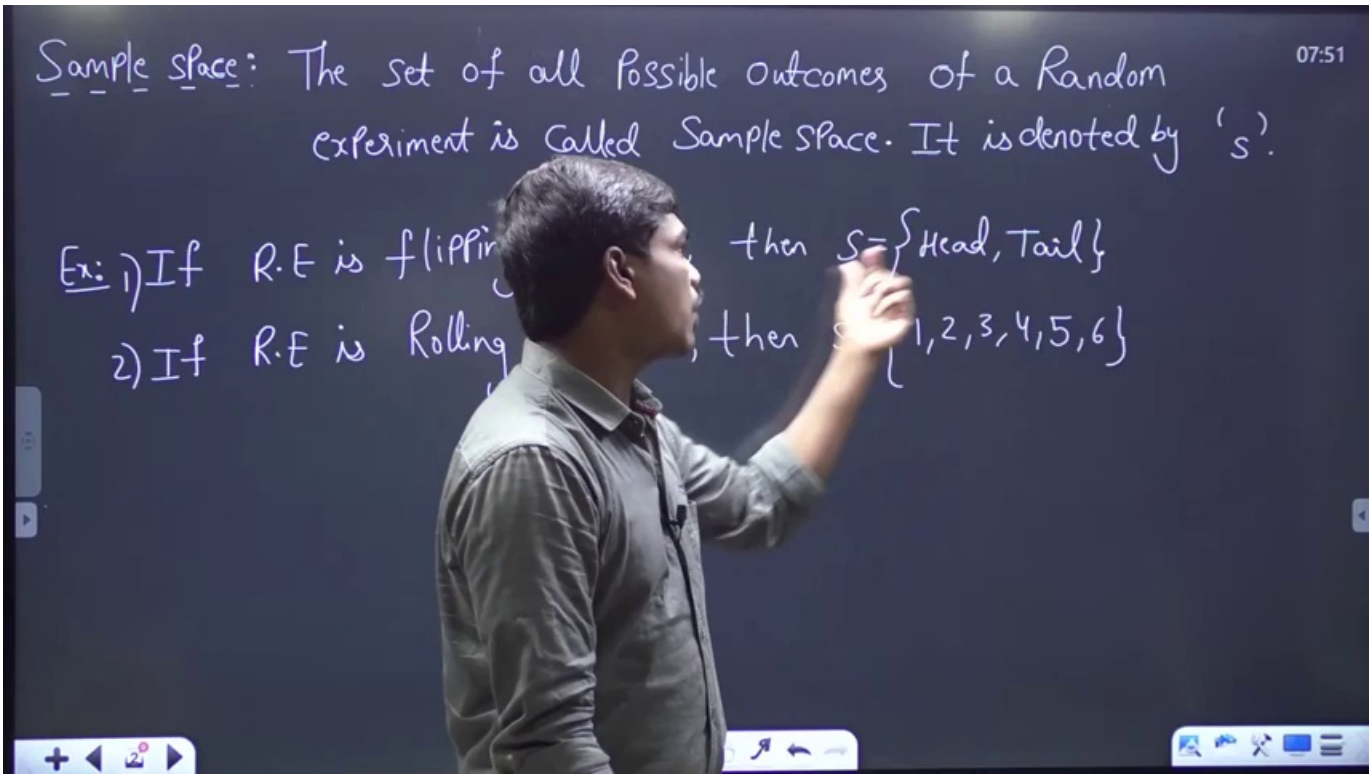
nothing but the set of all possible outcomes in a random experiment so if

you are conducting a random experiment then you know all the possible outcomes

means for example if you are flipping a coin there are two possible outcomes

curve what are they okay so we wait all this outcomes head untied in a sample

space and we do not the set containing all the outcomes with this yes where yes



corresponds to this sample space similarly sample space changes

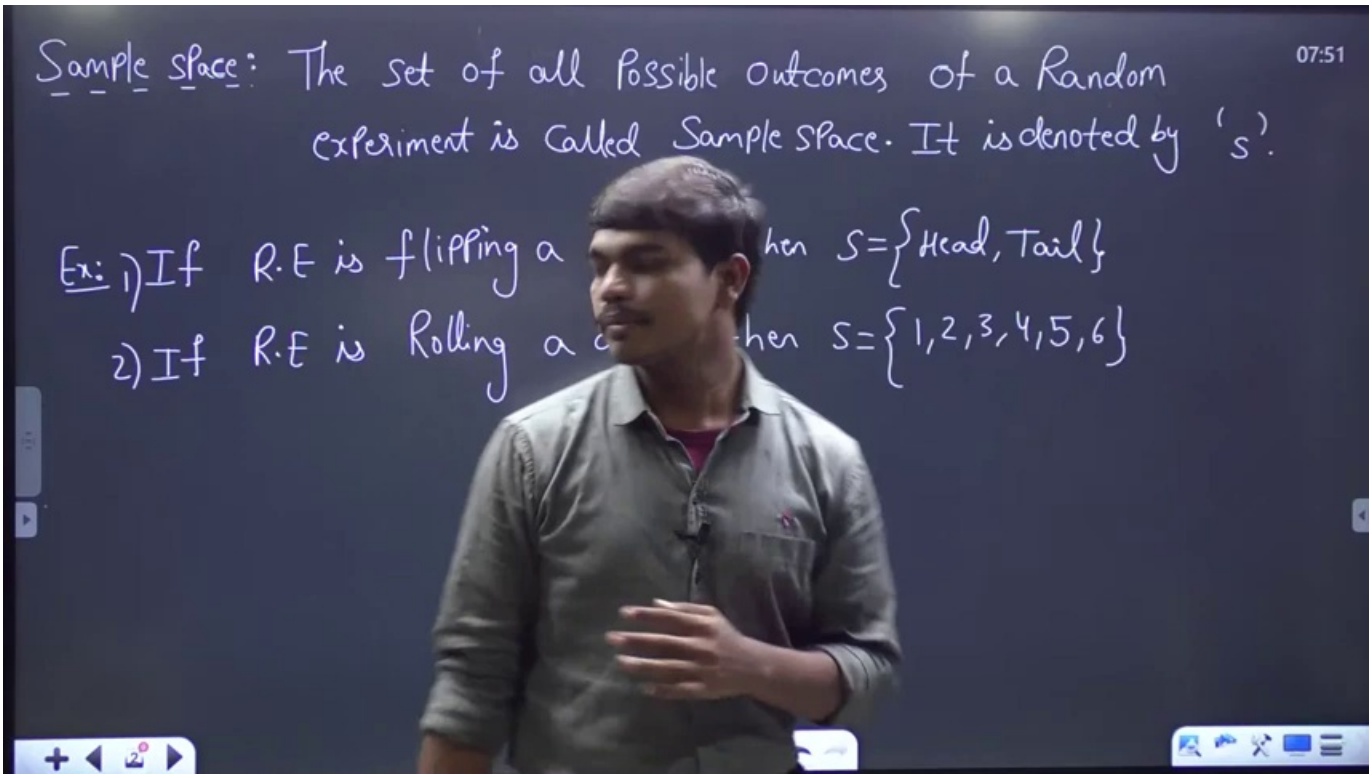
experiment to experiment if your experiment is flipping a coin then you

know samples phase consists of two elements basically this head and tail

and sample space consists of six elements if you are rolling a single day

and one two three four five six as well things like this that so did you all

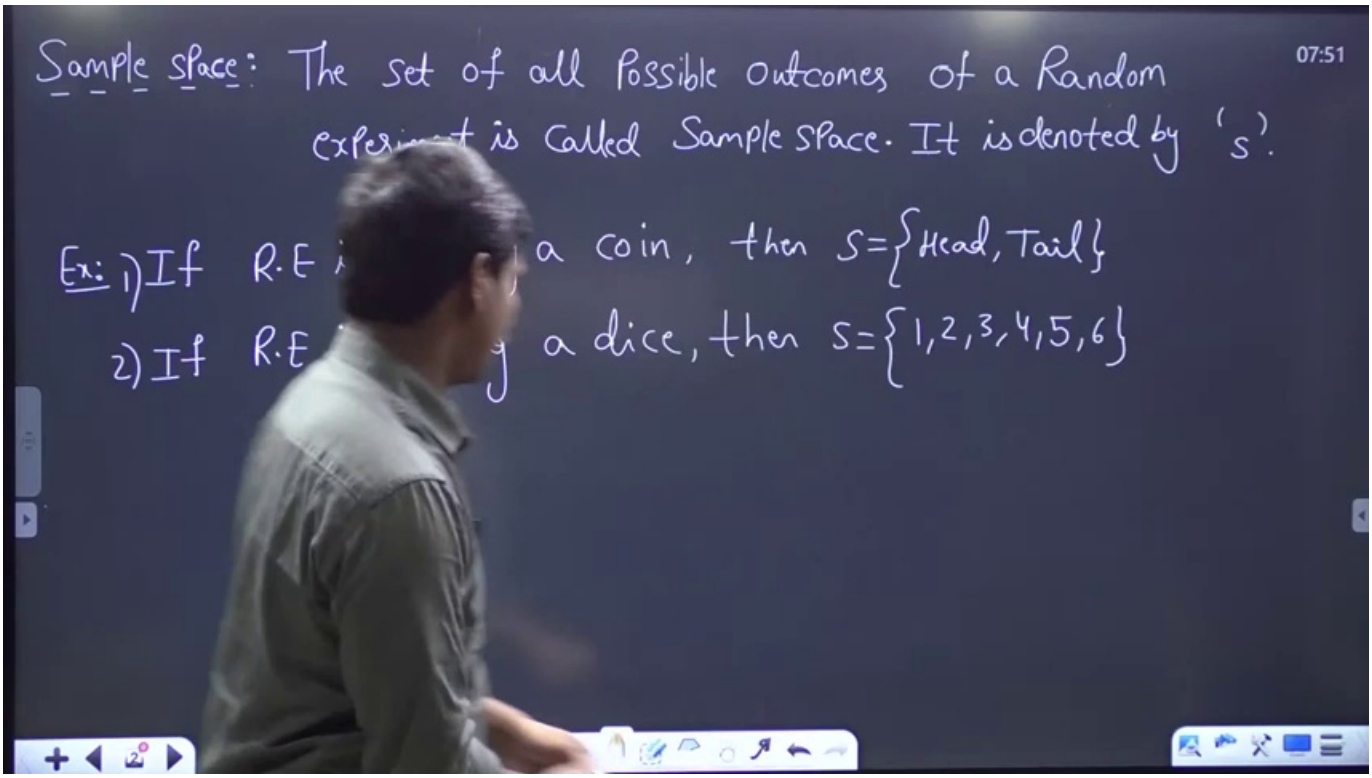
remember till this moment so can I start



today's class from this actually these two definitions we discussed in

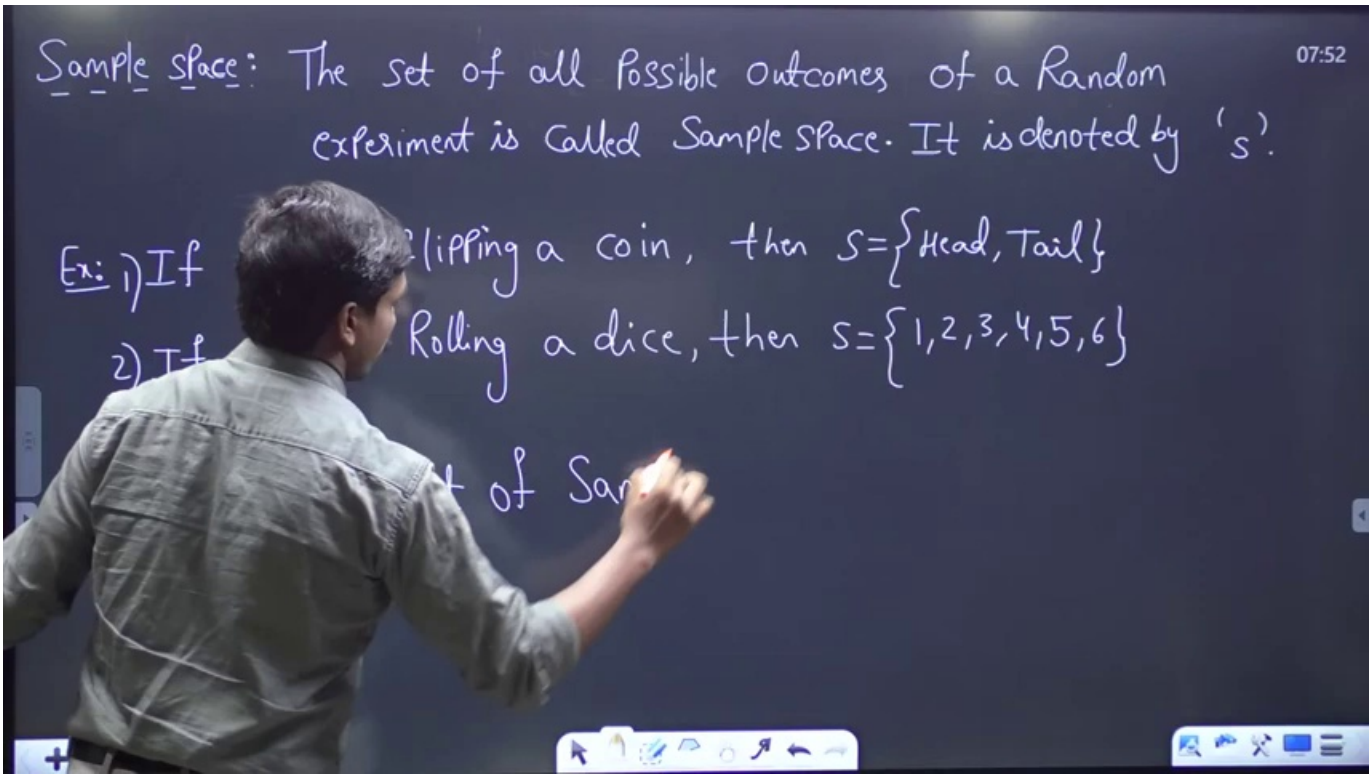
yesterday if you remember okay clear to all of you so shall I go ahead now okay

so now let us define one more thing



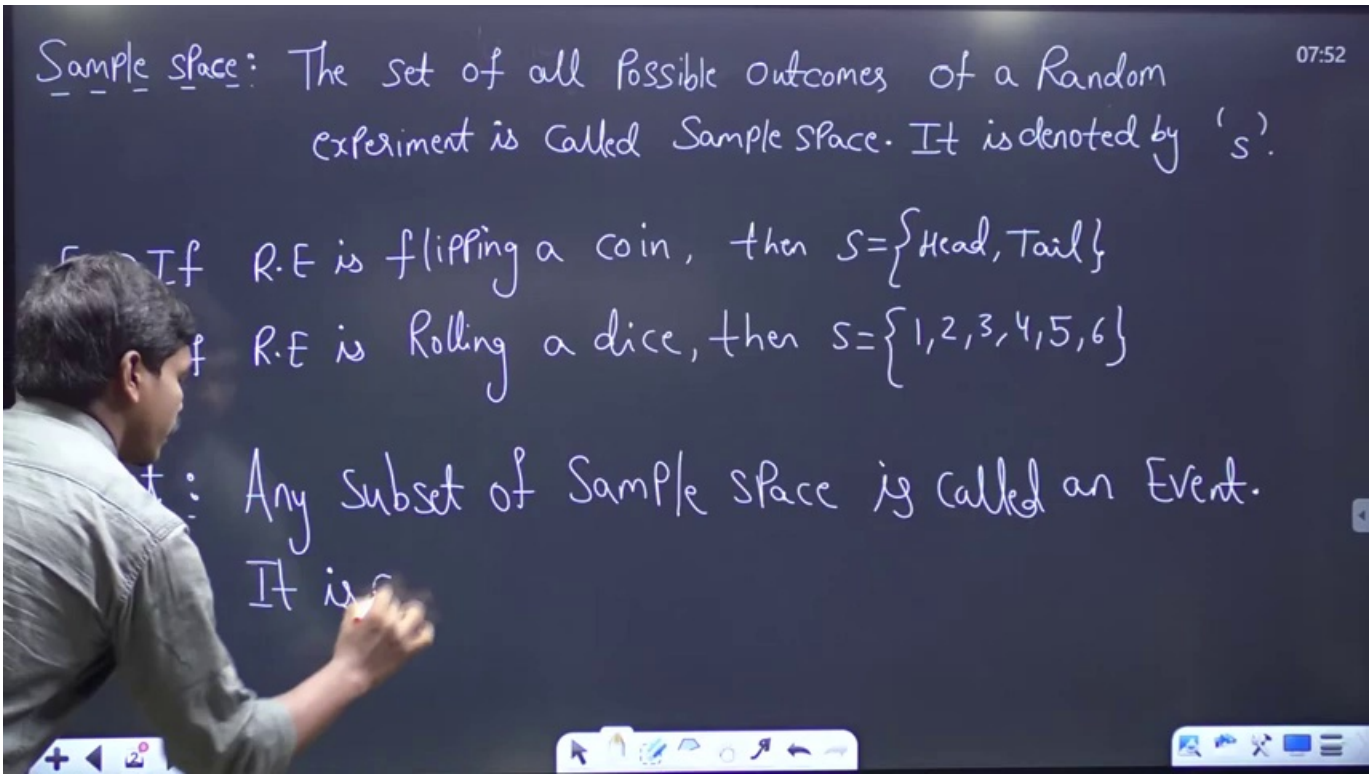
which is called event event okay now what is event it's not something similar

to Java the stand on that you see but event is any subset of sample space any



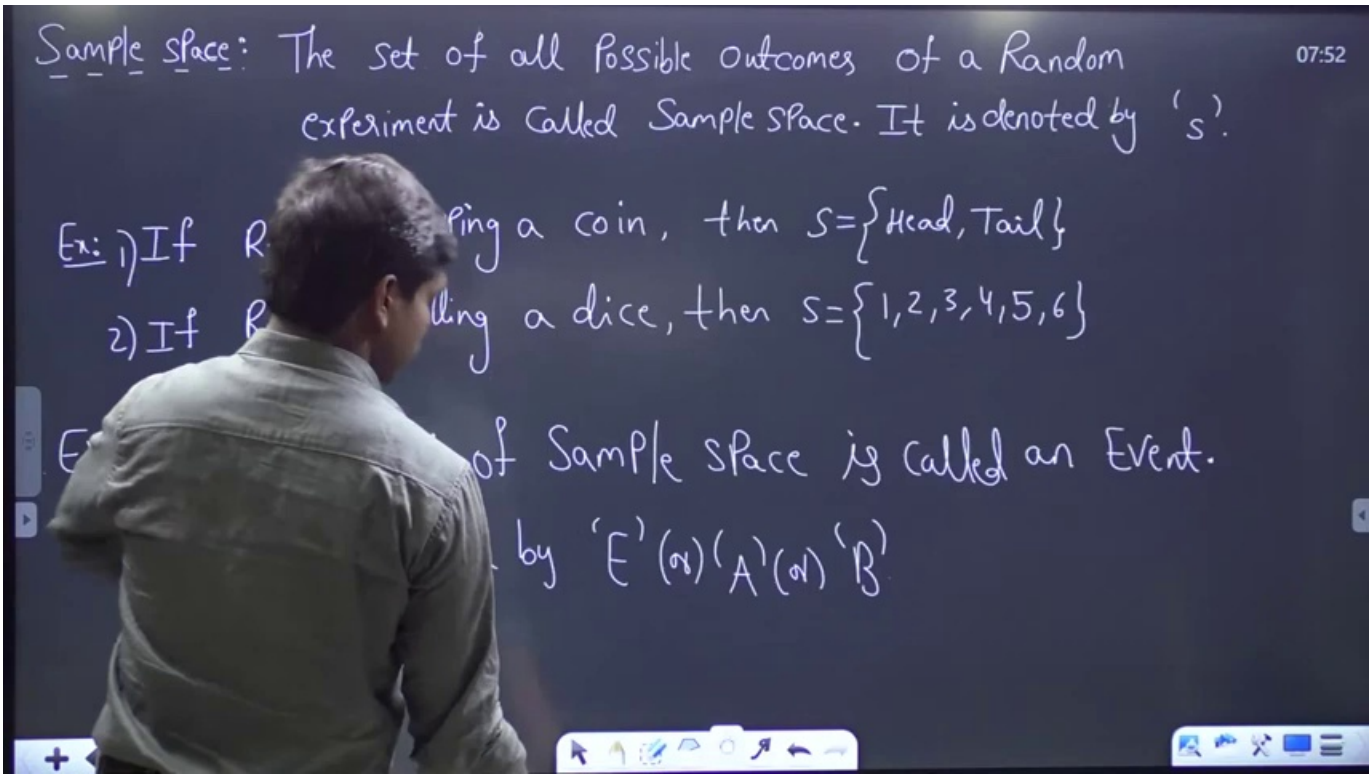
subset of sample space is called it's called an event any subset of a sample

space is called an event it is denoted by it is denoted by it is denoted by E



or Y a or yes I mean be whatever you want some capital nbers you can denote

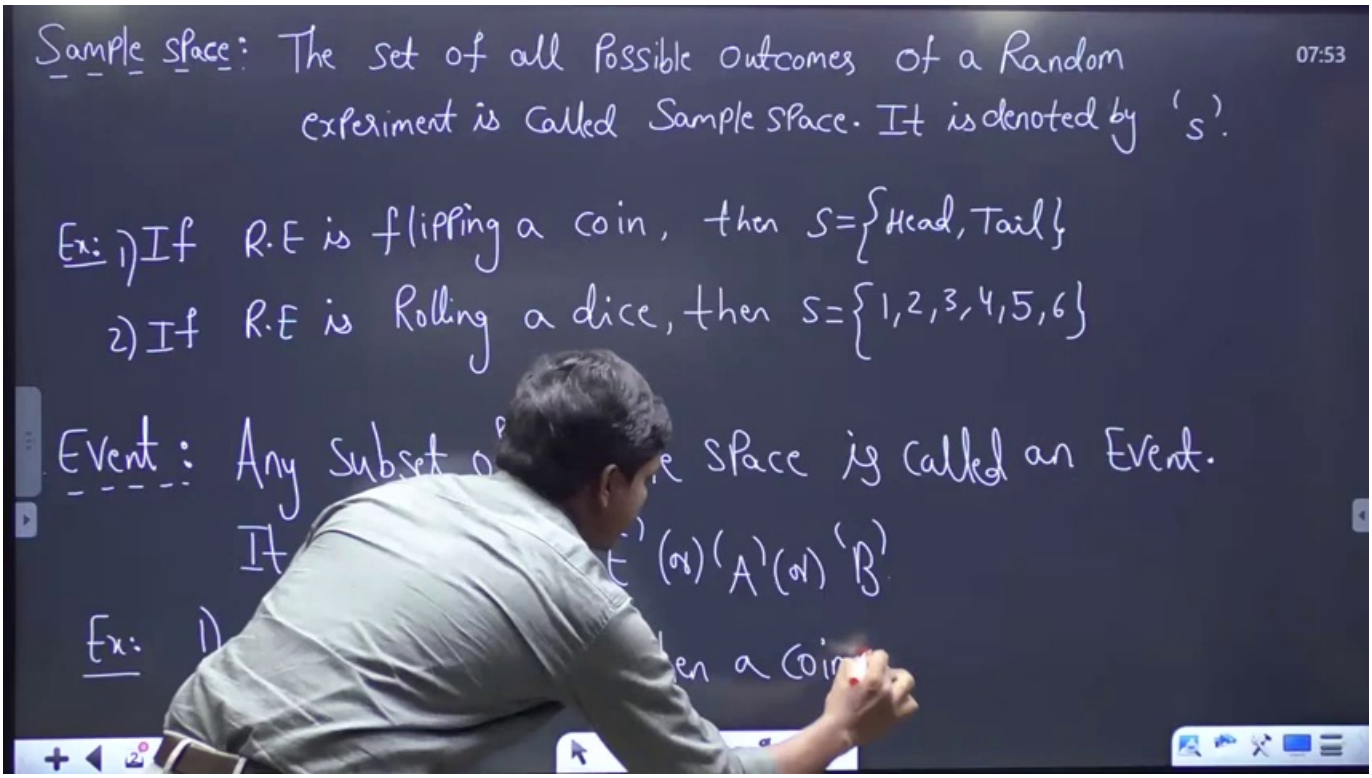
II 1 e 2 whatever okay so now if you talk about you events examples of your



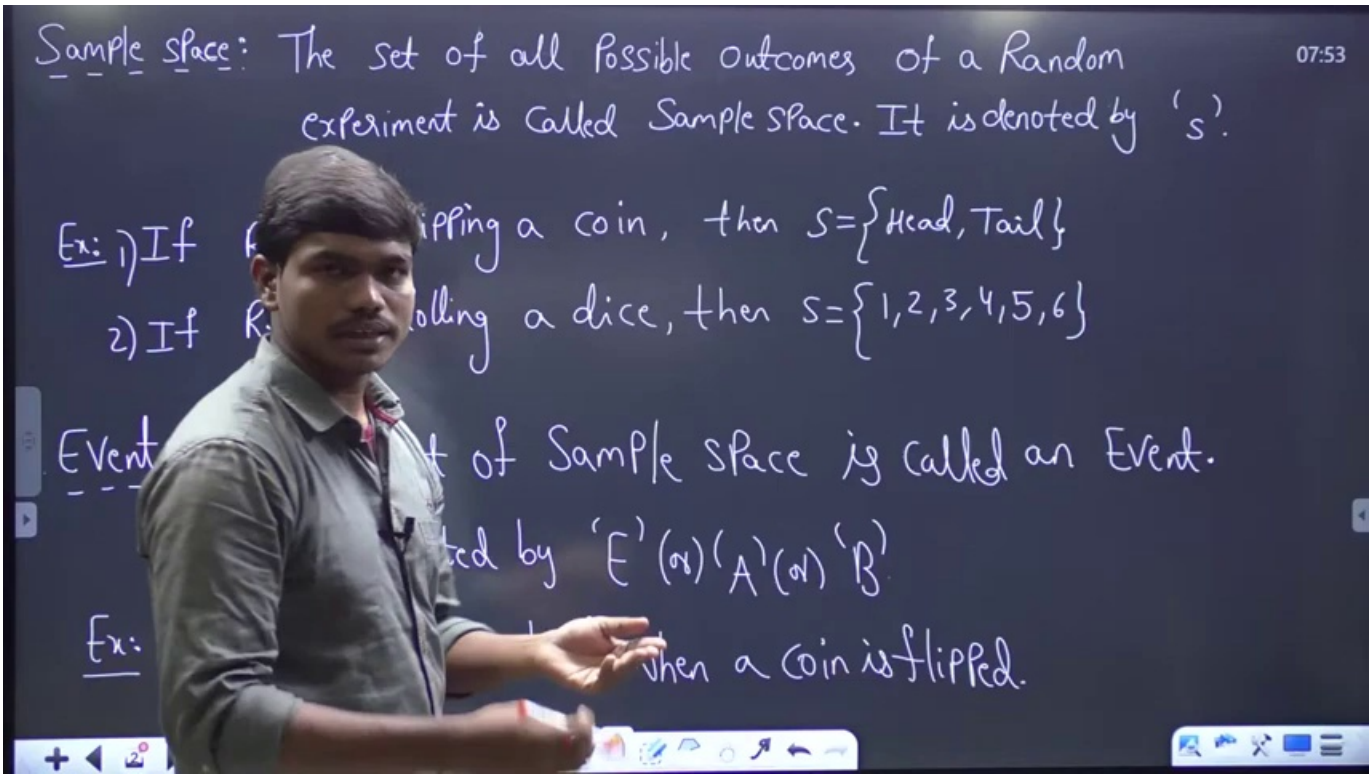
ends example since I am going with these two random experiments since the

beginning I would like to write appearing of a head appearing of a head

when a coin is flipped when a coin is



flipped okay so basically when you flip a coin and you have two possible outcomes what are they either head or tail but out of this either head or tail if you call this a kind of a head then you know this head is a subset of this sample space stuff so a kind of is an even similarly you can call any of

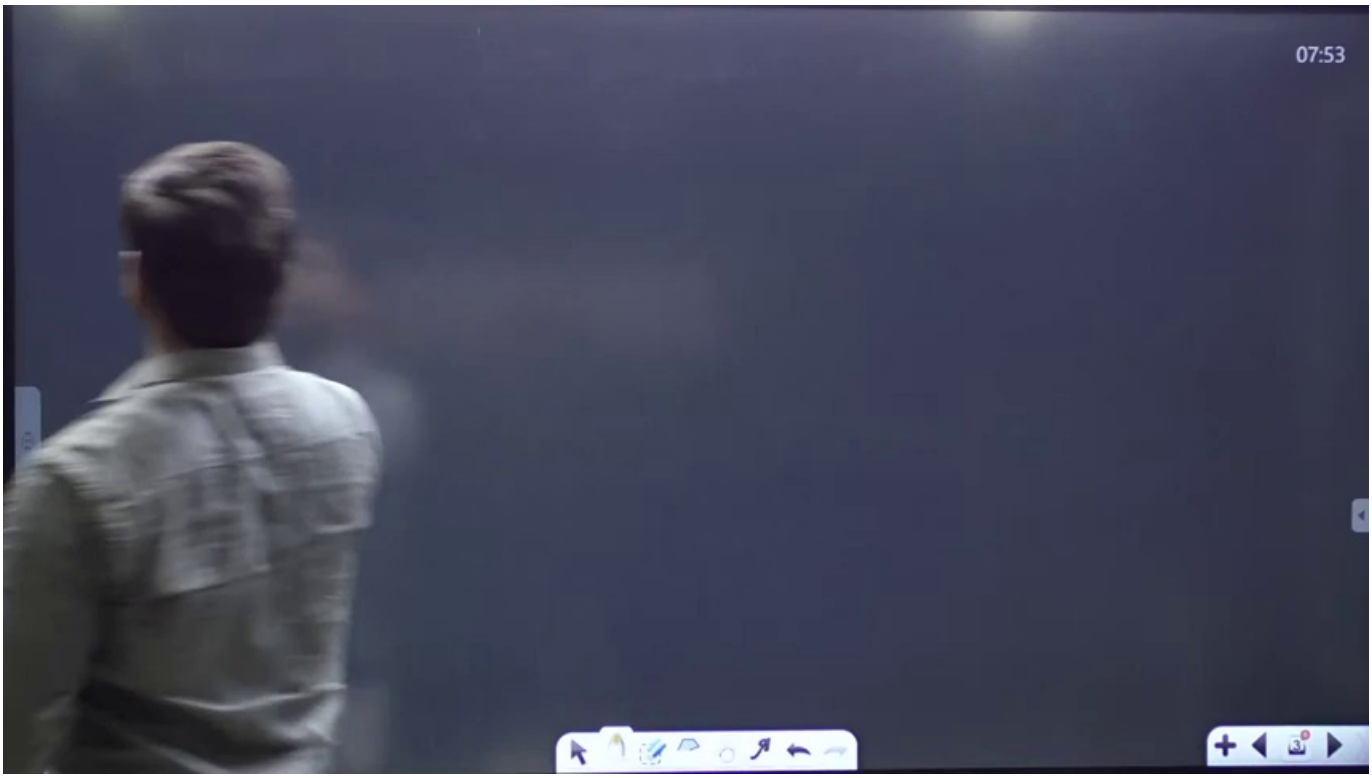


the events like for example when you are wearing a tie a kind of an even nber

then you see two four six which is a subset of this you know total sample

space yes we call that as an event so any subset of a sample space is called

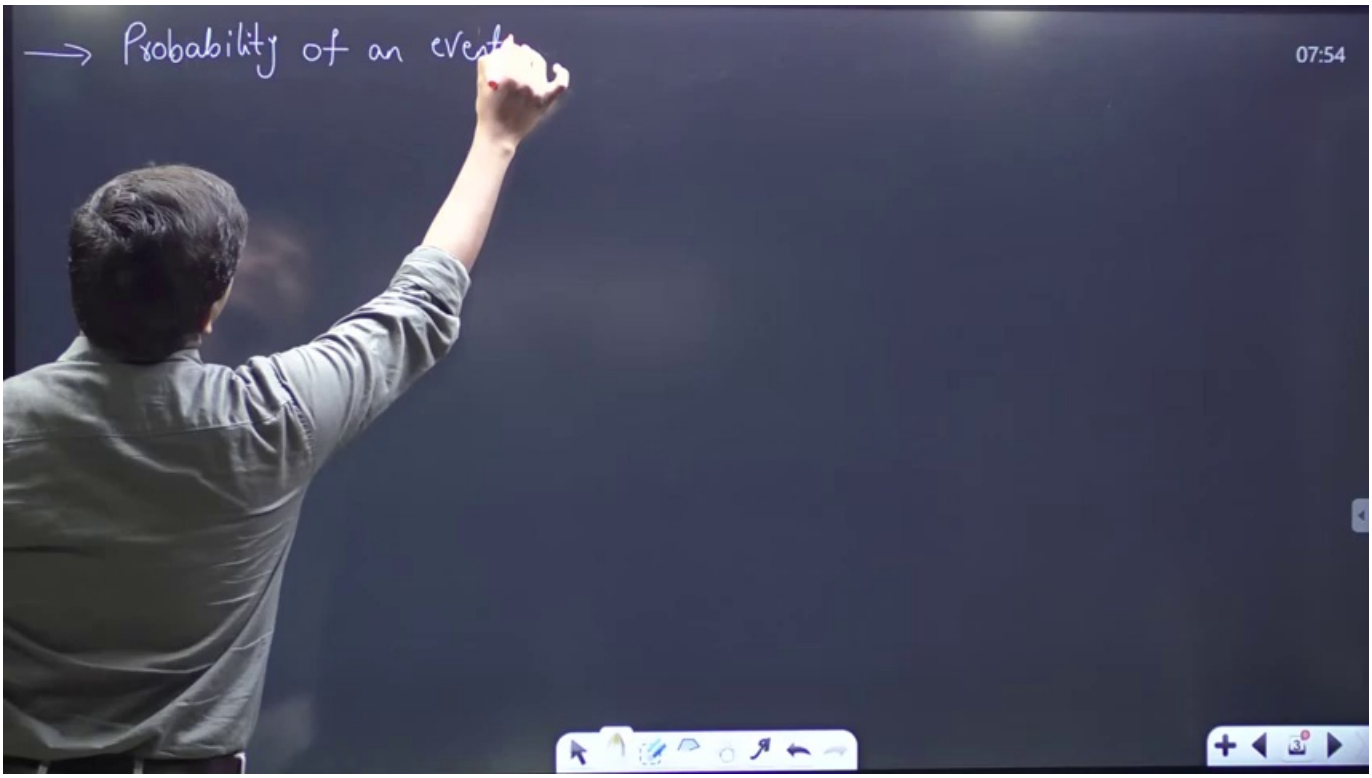
event okay so see here now we will see



something called odds in favor okay before going for odds in favor let me

define you what is probability so now we'll go for probability of an event

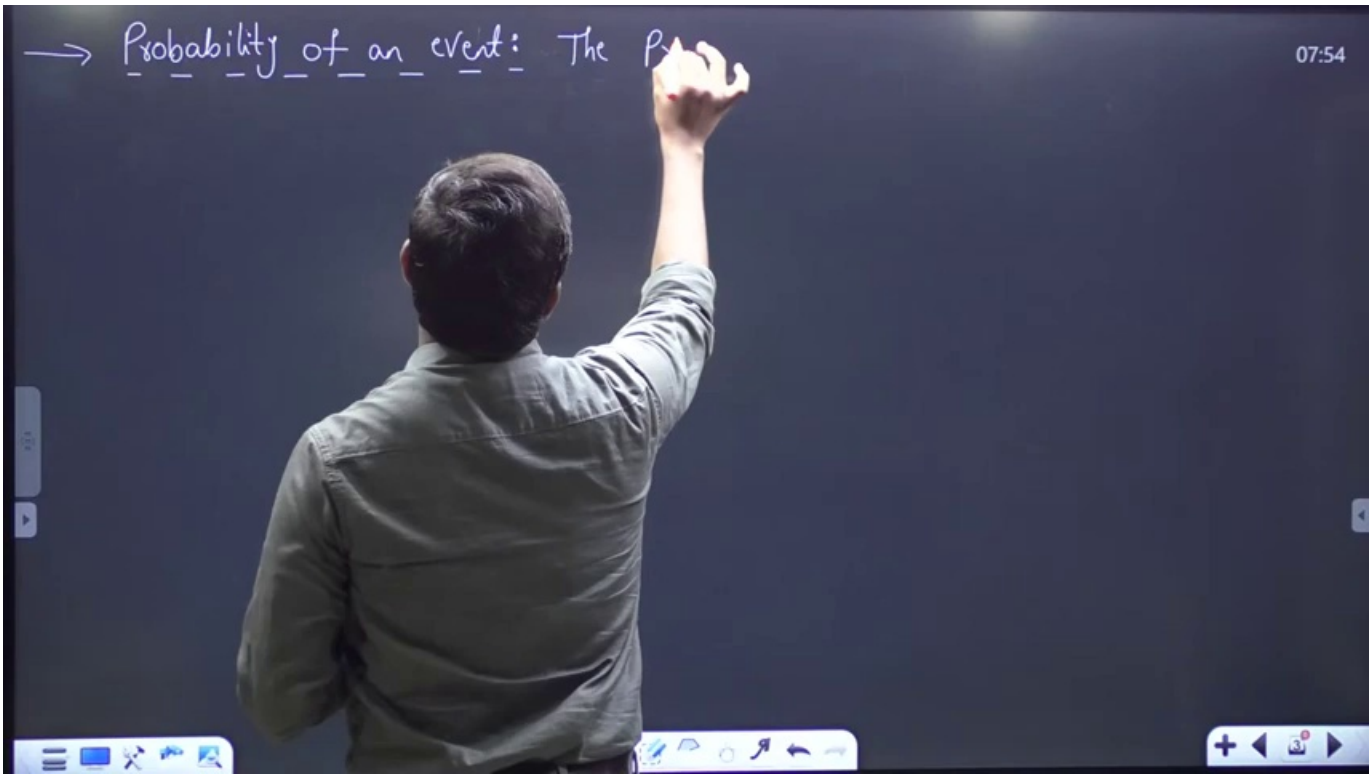
often event so what I think can you see



the board clearly is some part missing I guess no that so fight so probability of

an event so now you know even is nothing but samples I mean subset of sample

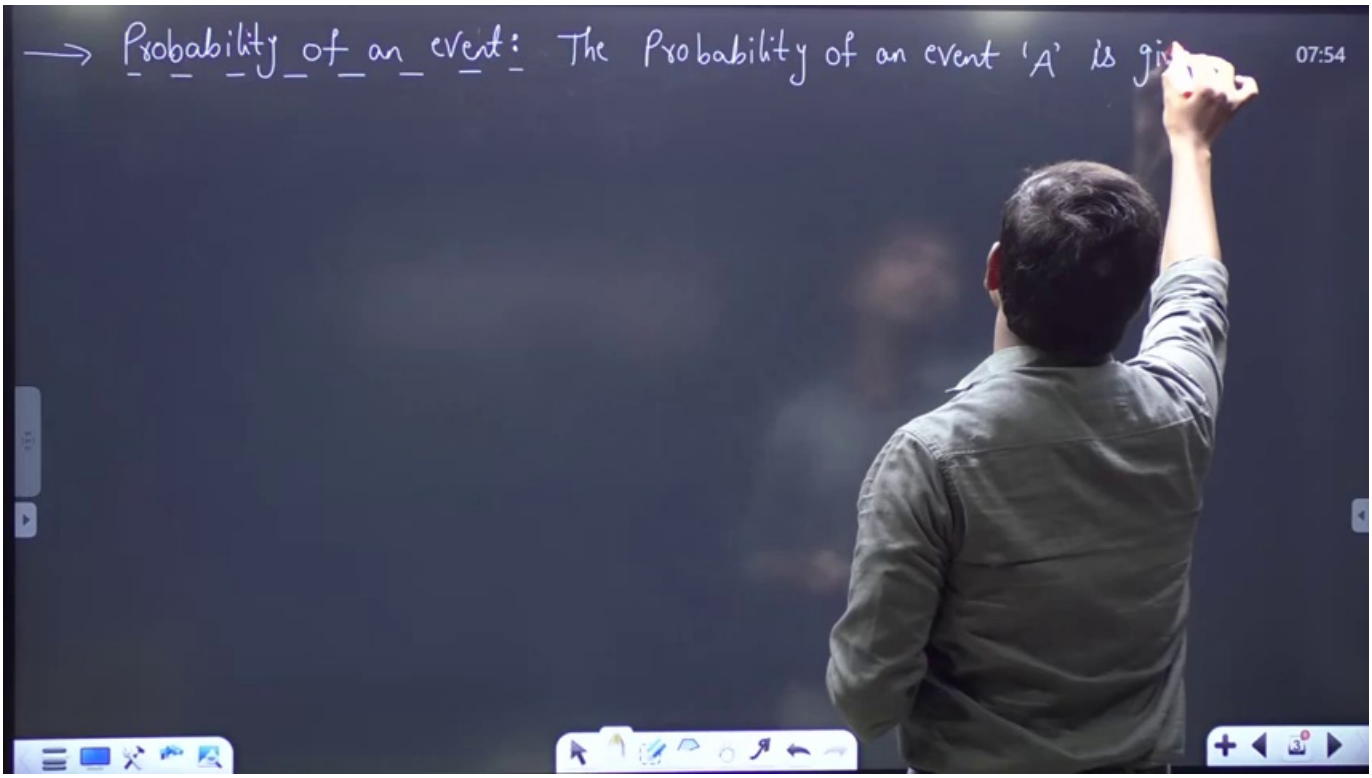
space so if you want to talk about probability of an event the probability



of an event a the probability of an event ei is nothing but the chance of

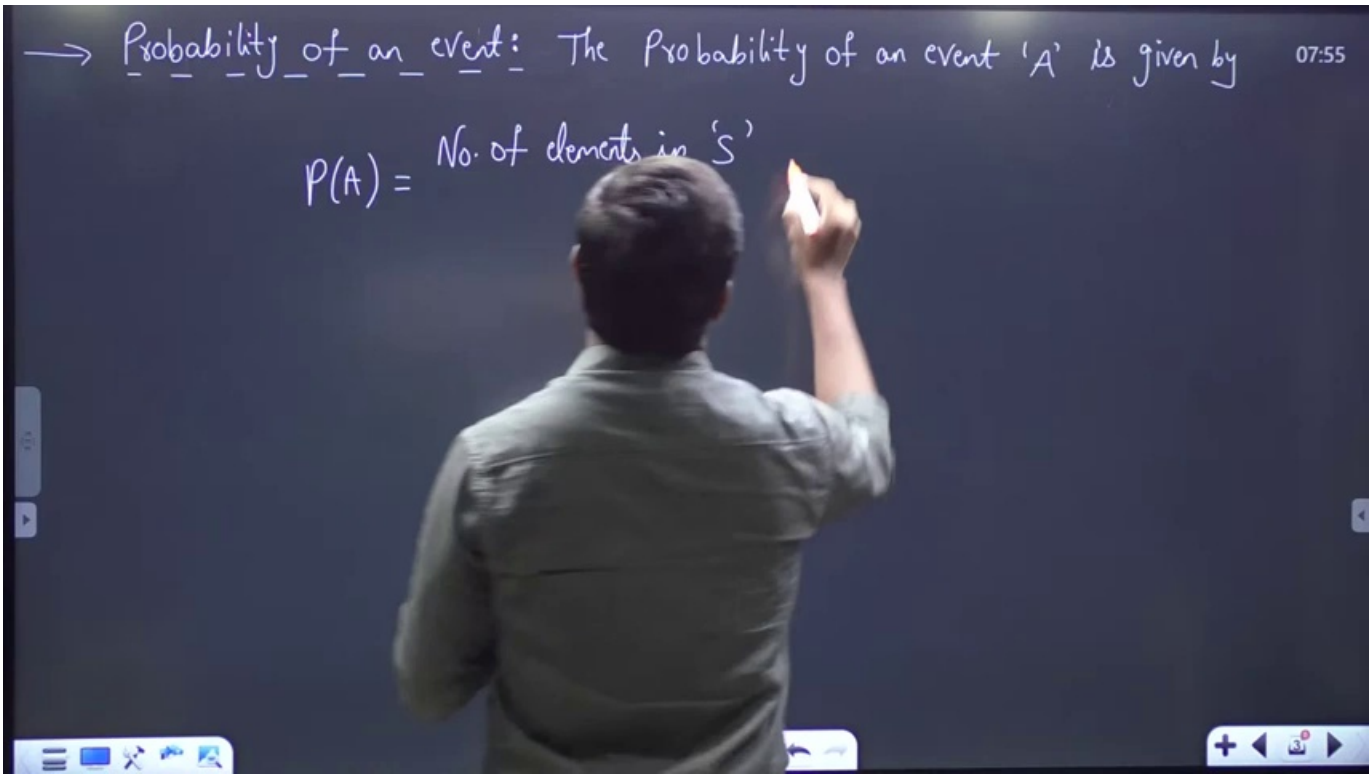
happening of here which you already know so the probability of an event a is

nothing but the chance of even ta to happen at that moment is given by is



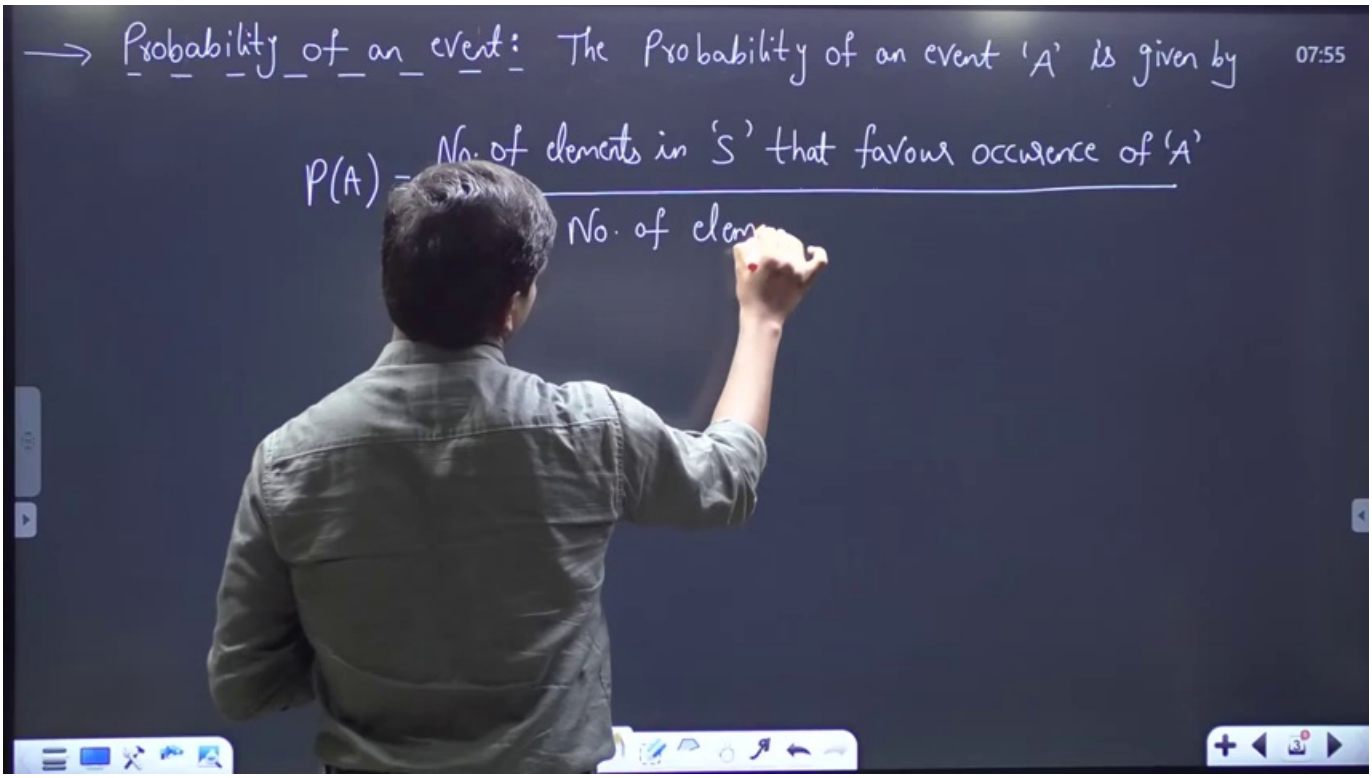
given by P of a is equal to nber of elements in yes mayor stands for sample

space yes so see here nber of elements in yes that favour occurrence of a that



favour occurrence of a divided by total nber of elements total nber of

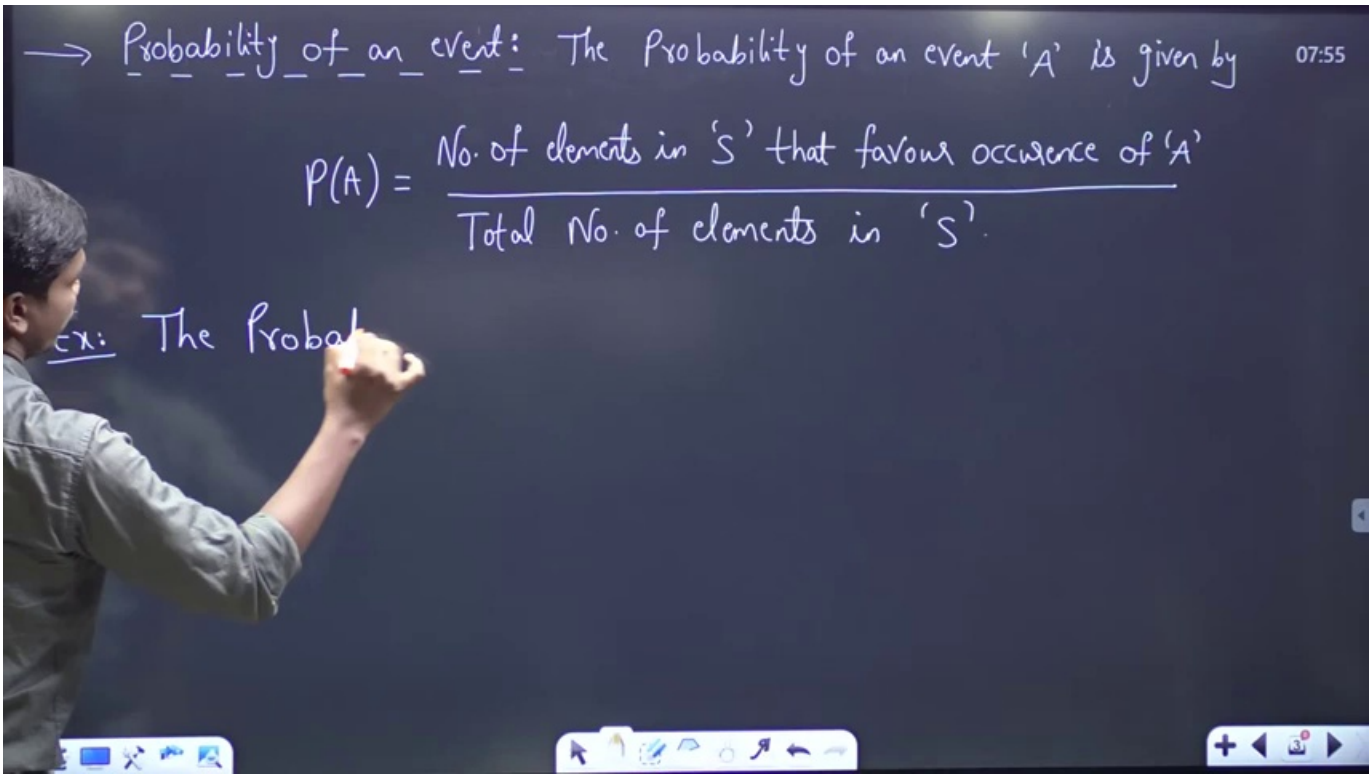
elements in yes which is sample space so



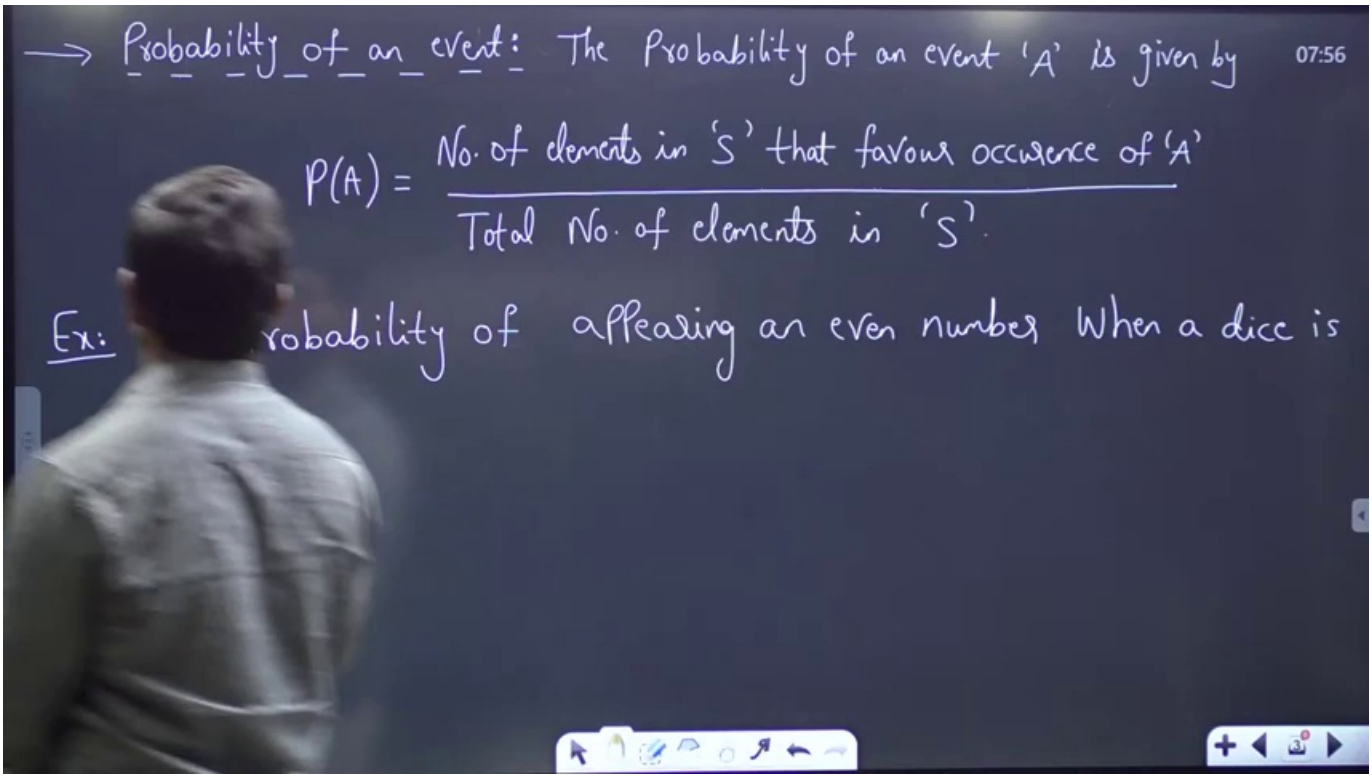
if you see divided by total outcome so favorable outcomes divided by total

nber of outcomes means for example if you see if I ask

an example see here the probability of the probability of appearing an even



nber when it dices old if I ask you this when a dice is rolled if I ask you

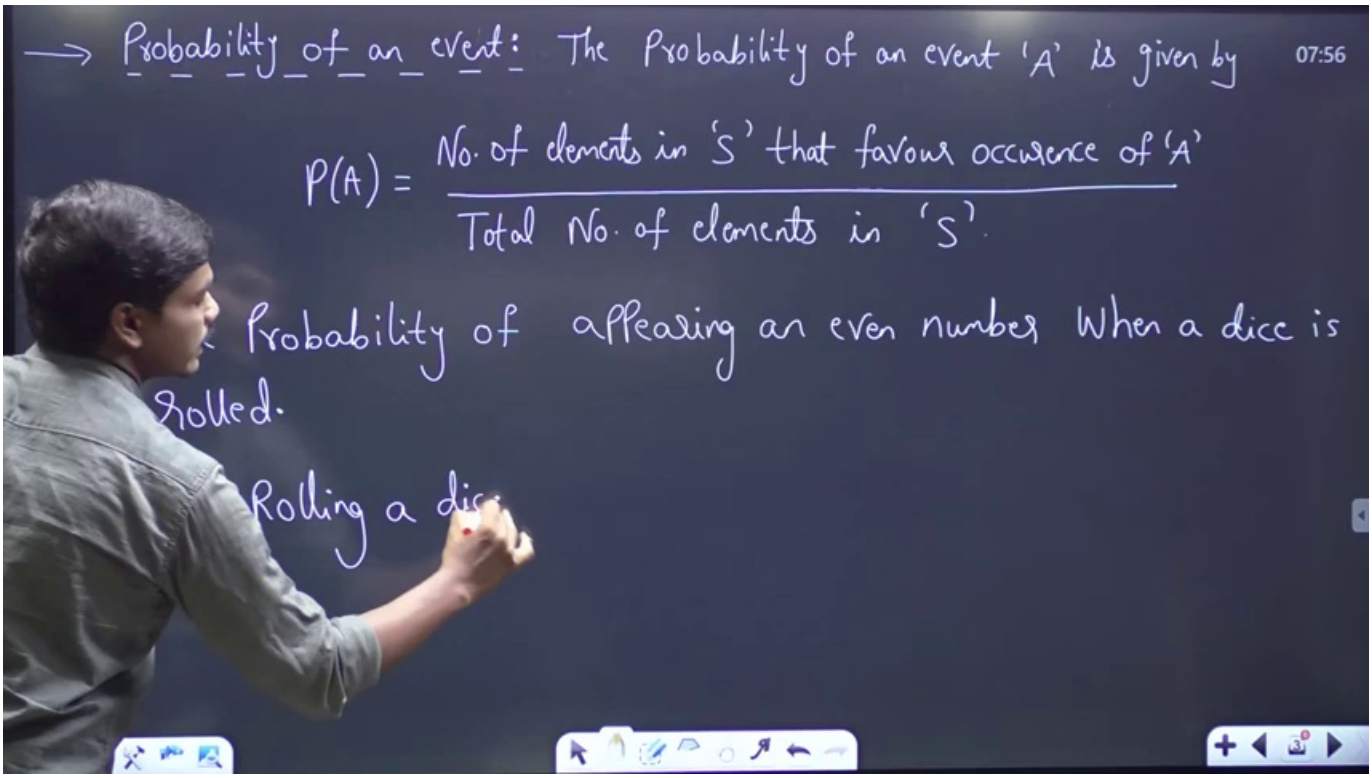


this see here yeah nerator is basically event okay so

denominator is total sample space so see here so now if you write random

experiment random experiment is rolling a dice of course a single day

I mean rolling a dice otherwise I'm gonna have stated a payoff dice or three



dice something like that but if I'm mentioning only die it's a

one-day so random acts mint is organized so what is the sample space now for this

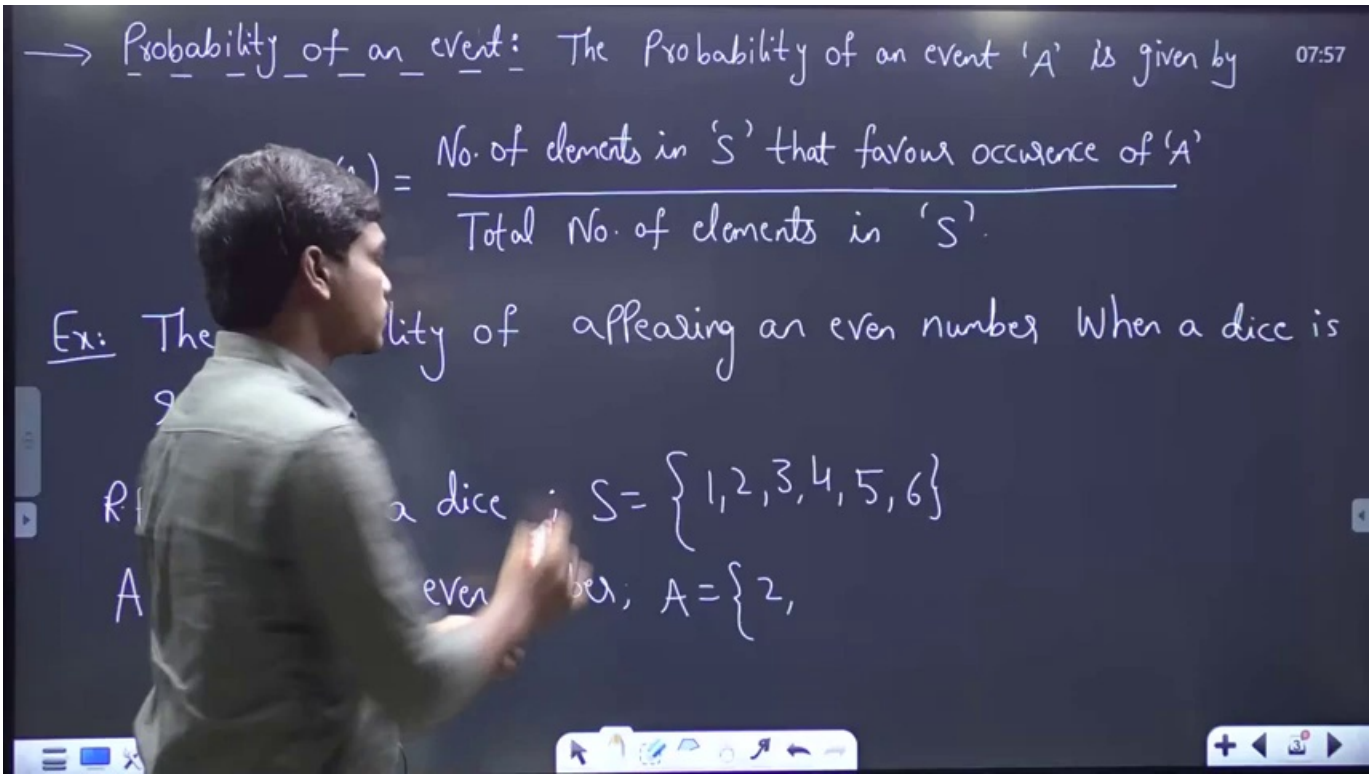
random experiment 1 2 3 4 5 & 6 cut now yeah is the event of getting an even

nber even nber so if you write the set a with all favorable outcomes of a

when you die a when you own a tie if 2 appears then your event occurring an

even nber gets satisfied so 2 is one favor will outcome to make this event

appearing of an even nber happening okay so applying an even nber is the

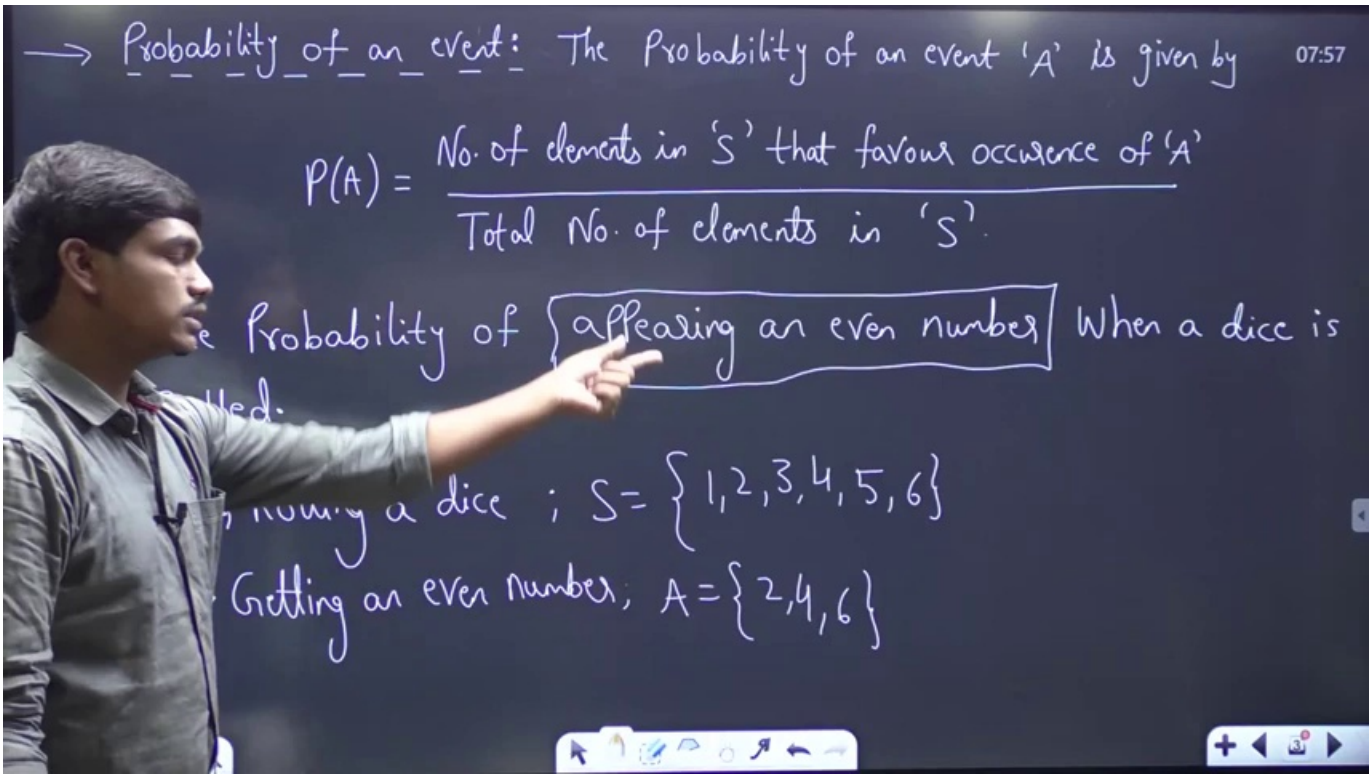


event that you're talking about and this two is one of the outcome in the sample

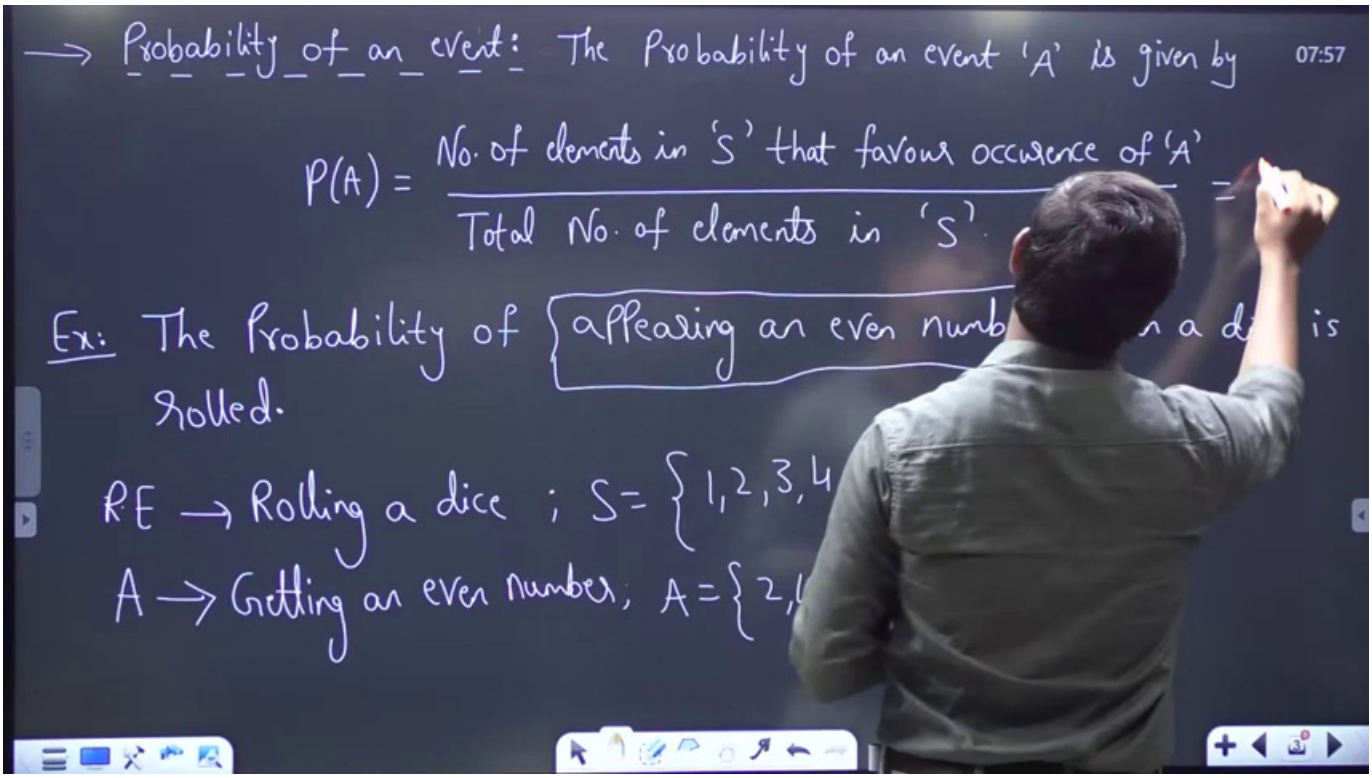
space which could favor this event similarly for for is one more out term

of this sample space which could favor this event similarly 6 so if you see 2 4

6 other events are the outcomes that traverse this event yay so if you write



cardinality nber of yay this is called cardinality nber which means basically how many elements are there within a particular set that nber is called cardinality nber and you know if there are thing L iment speed note n of a is equal to 3 and this implies n of s is equal to 6 so this is basically the definition of young of a divided by



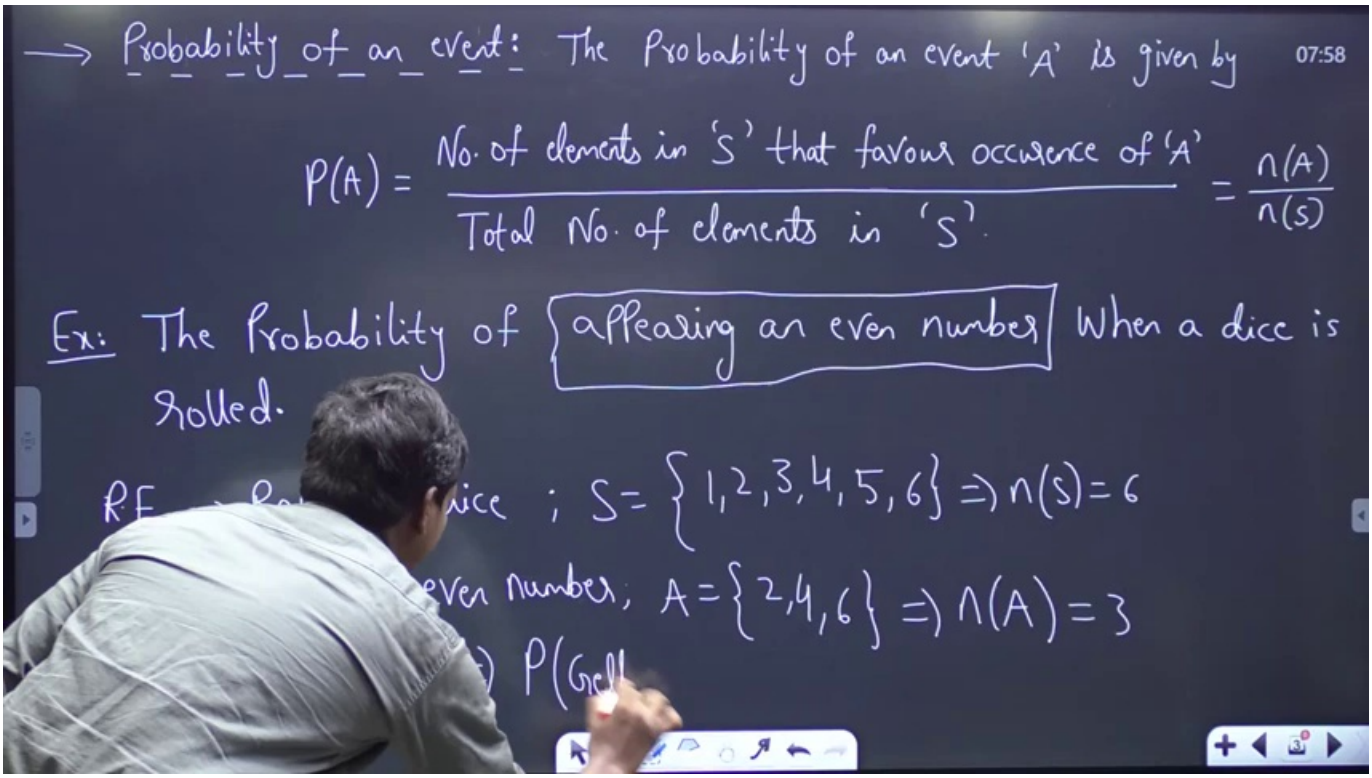
young obvious means nber of elements in set a

is the set containing all favorable outcomes and en office is the nber of

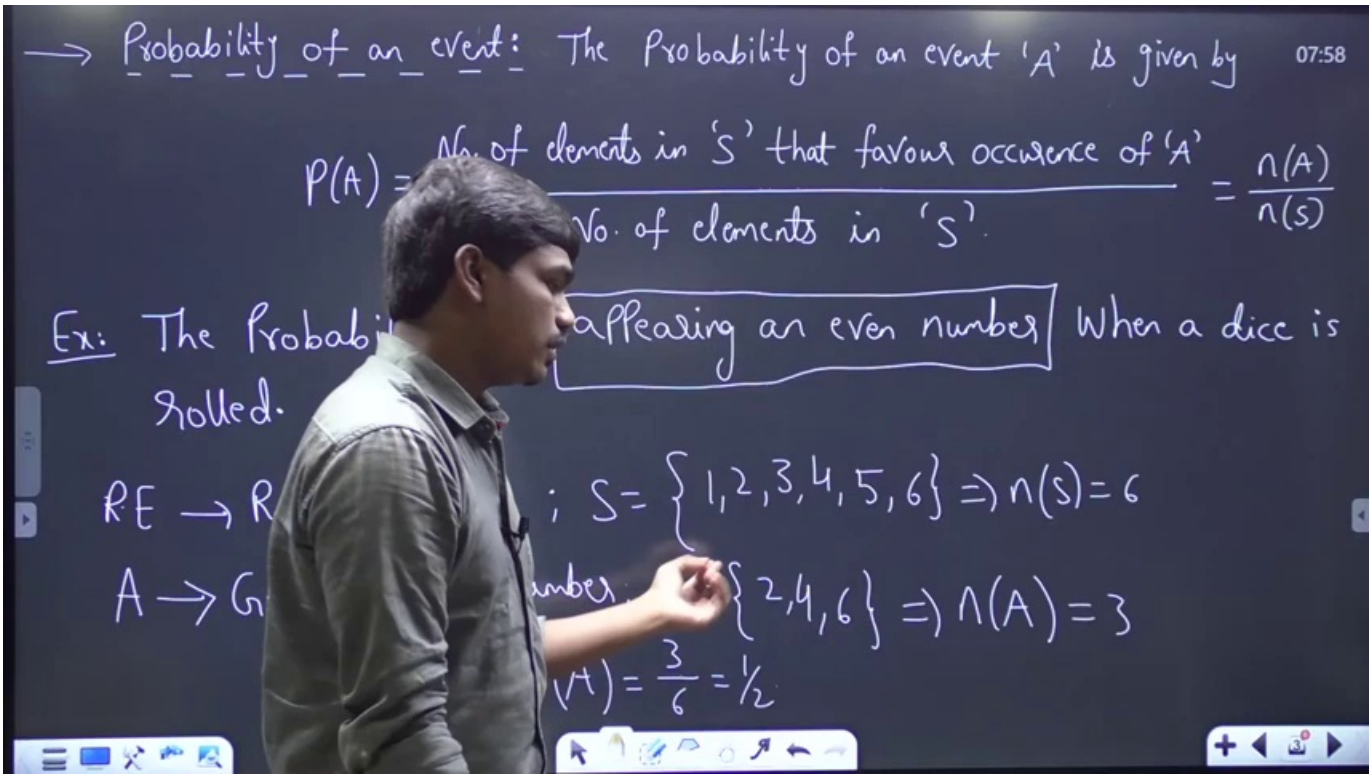
elements in sample space where yes response to a given a random

experiment so if you see this is the and this is 6 so this implies probability of

getting even nber getting you since I



have denoted this ETA we can know it's right away probability of a is equal to say by 6 which is 1 by 2 okay so this is the basic definition of probability when you have a random experiment associated with a certain outcomes so did you all understand the basic definition of probability what you know what could



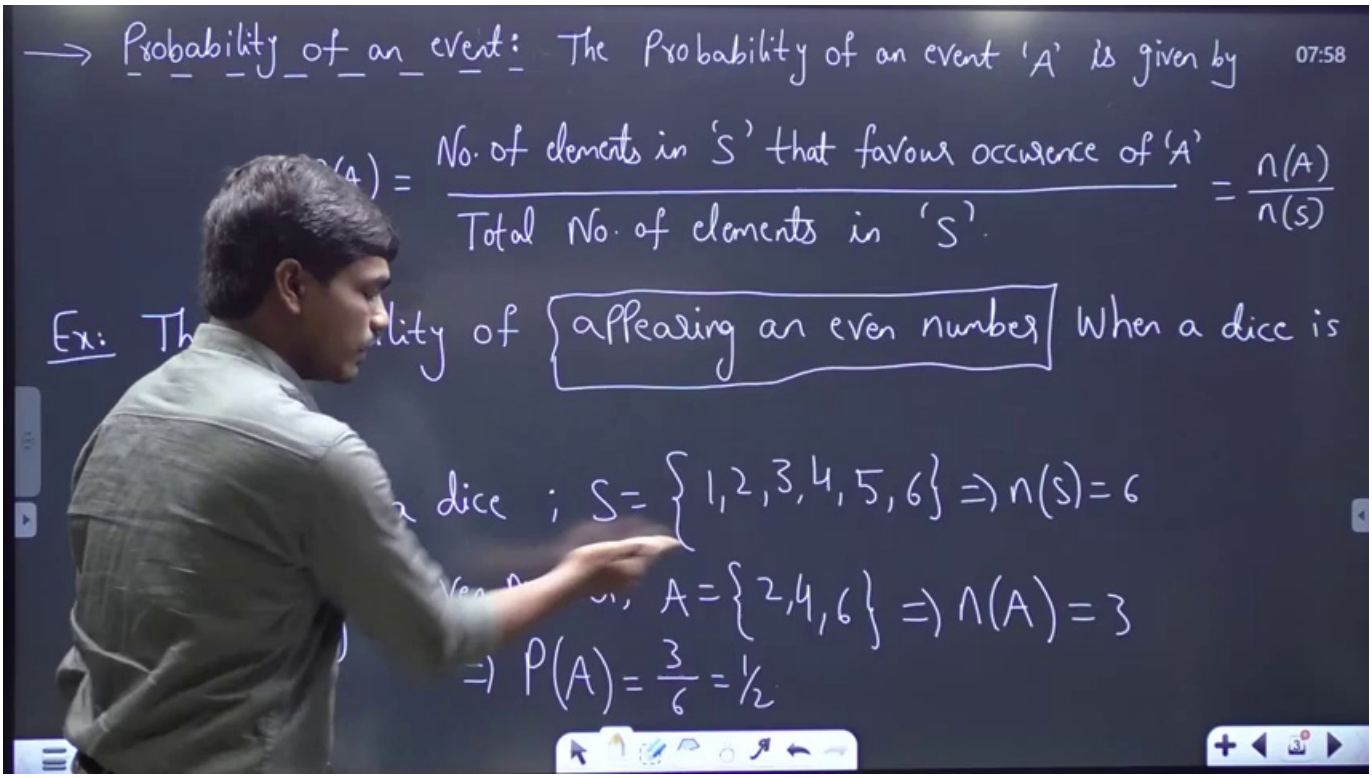
give us the expression for probability of an event so it's nothing but nber

of favorable outcomes divided by total nber of outcomes of course this is a

this is a easy question so just by looking at this question you can tell

the answer is 1 by 2 but when questions are a bit difficult

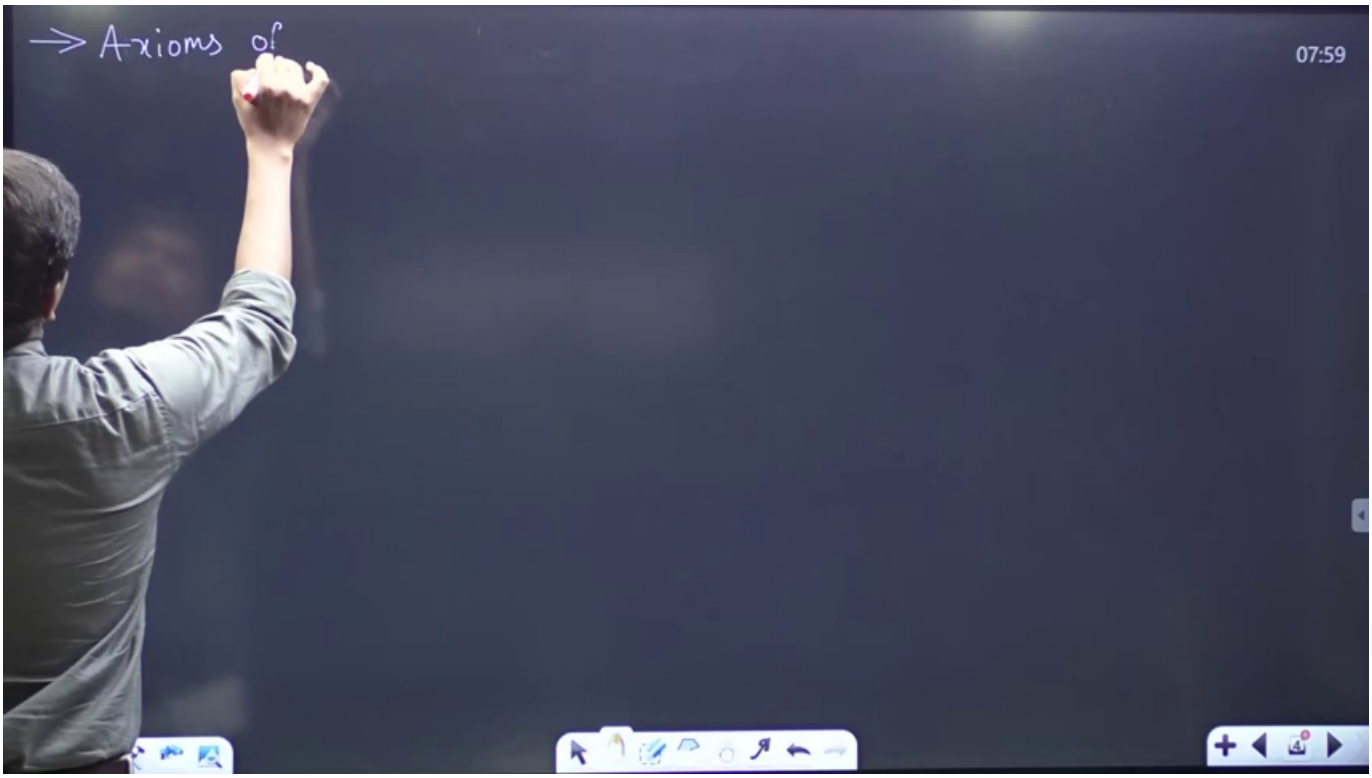
or a bit next level then we could always



apply this definition to get the probability first simple events ok next

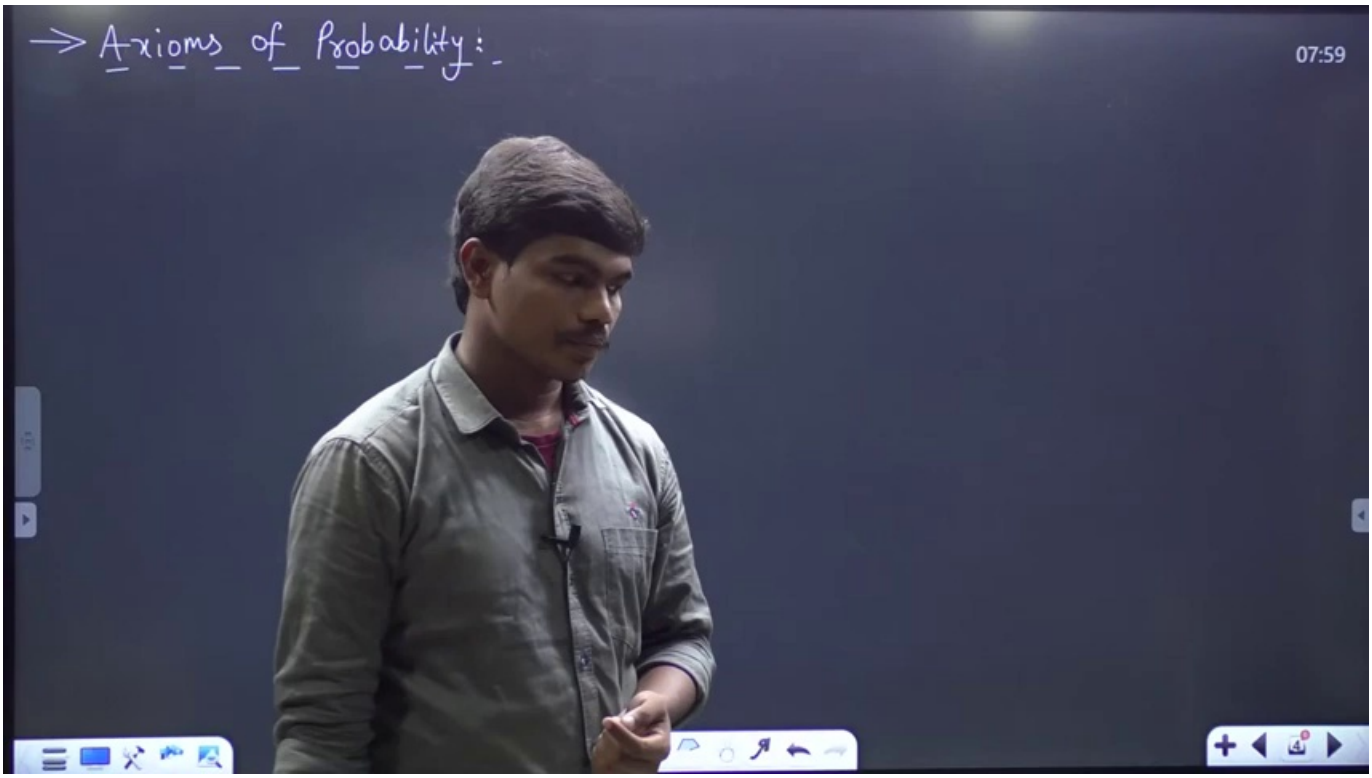
so if you see this next we'll go for we have seen what is an event so and then

we'll go for something called the axioms of probability axioms of probability



what are called axiom what's the main difference between axiom and here can

anyone tell me that what's the main difference between axiom anti



so please tell me what the main difference between axiom and here

please tell me there is no proof so generally for themes you can start with

some basic questions and you can show that the results are correct but axioms

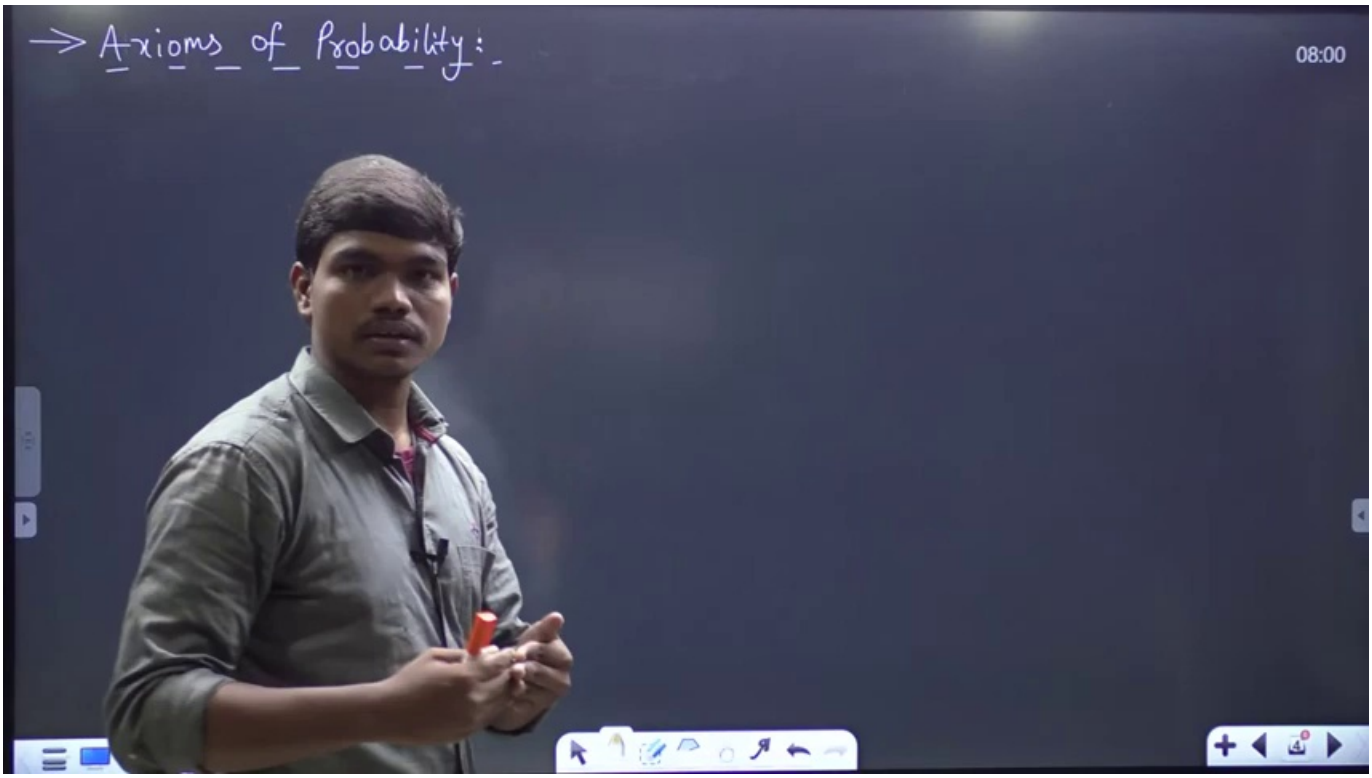
you know they can't be proved mathematically you know like they'll

come to my default for example if I say you Sun rises in the east there is

nothing like you for that one day you'll take me in the monitor it it happens

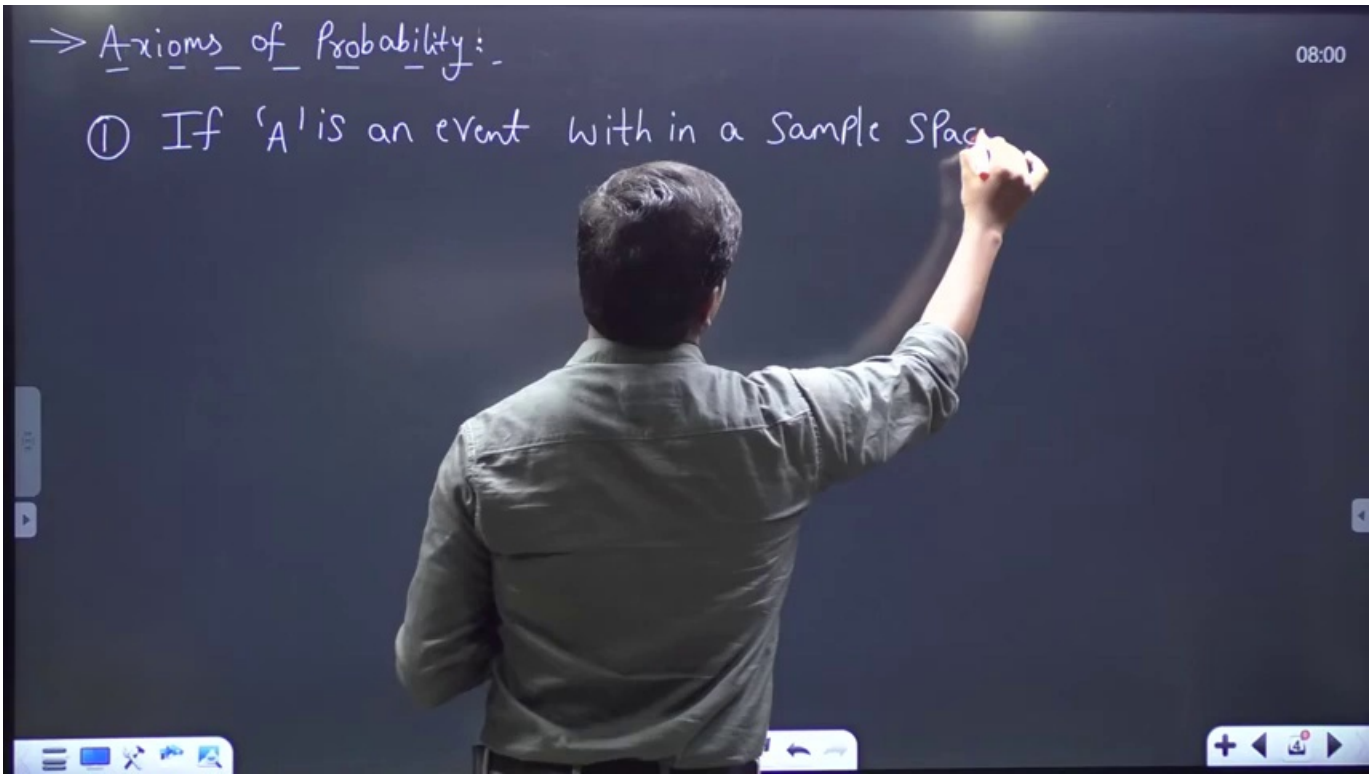
slightly so you can see that so some phenomena they are cut by default in

this nature so if you see there are no explanatory proofs for them but these



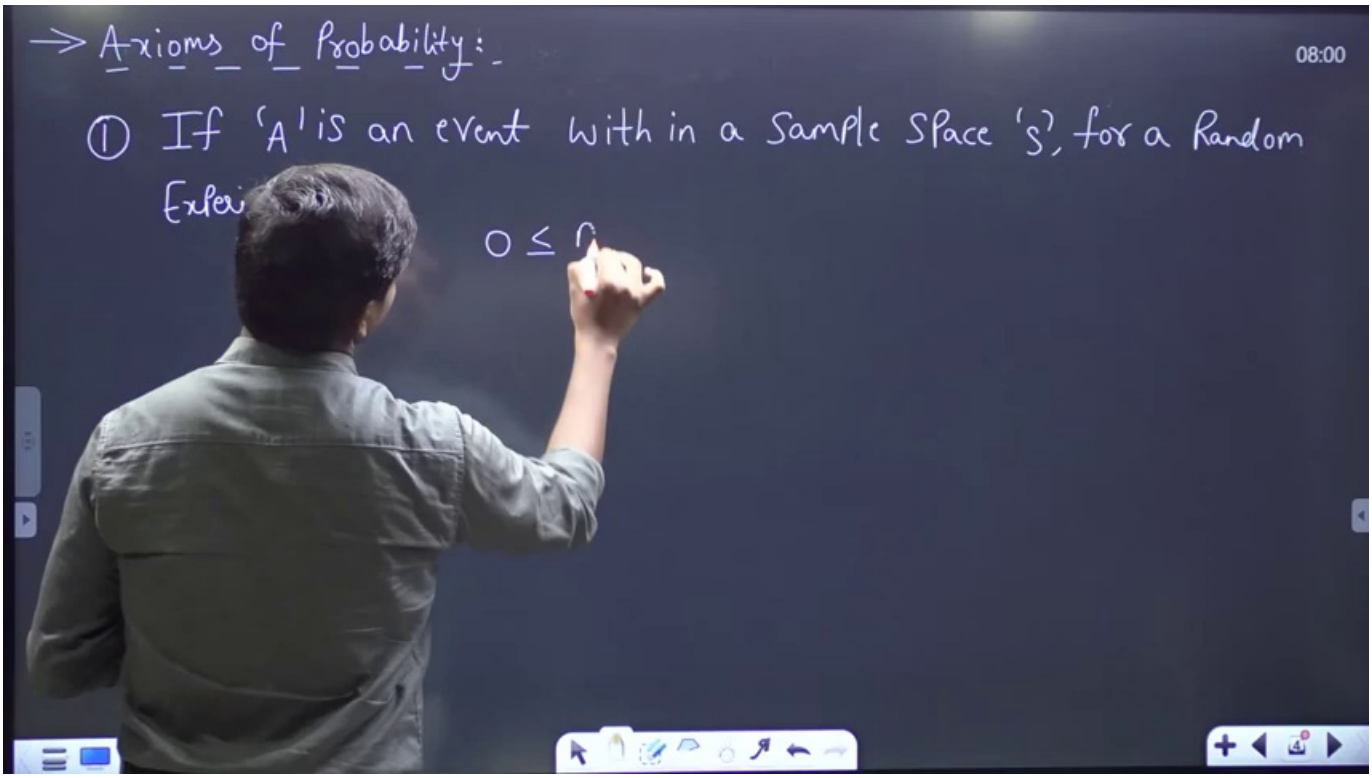
statements are generally kept so I would like to show you that one if a is a

event if a is an event within within a sample space yes within a sample space



yes for a random experiment for a random experiment then one thing that happens

by default is zo less than or equal to nber of elements in a less than or



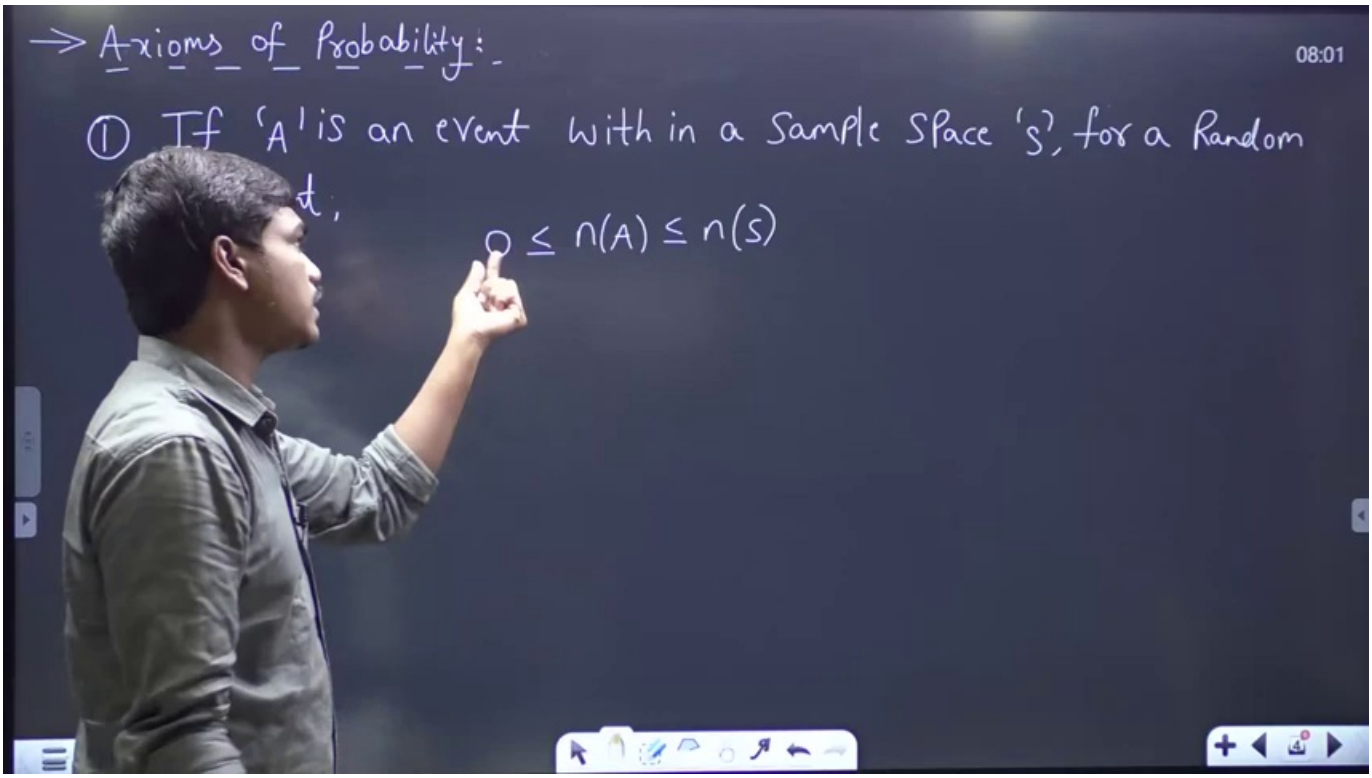
equal to n okay definitely if a is subject obvious then definitely the

nber of elements in this ray will be definitely will be less than or equal to

n of s and of course there will be either positive or zero because they

can't be negative nber of favorable cases that I think there is some power

because you learn zo or if there is more



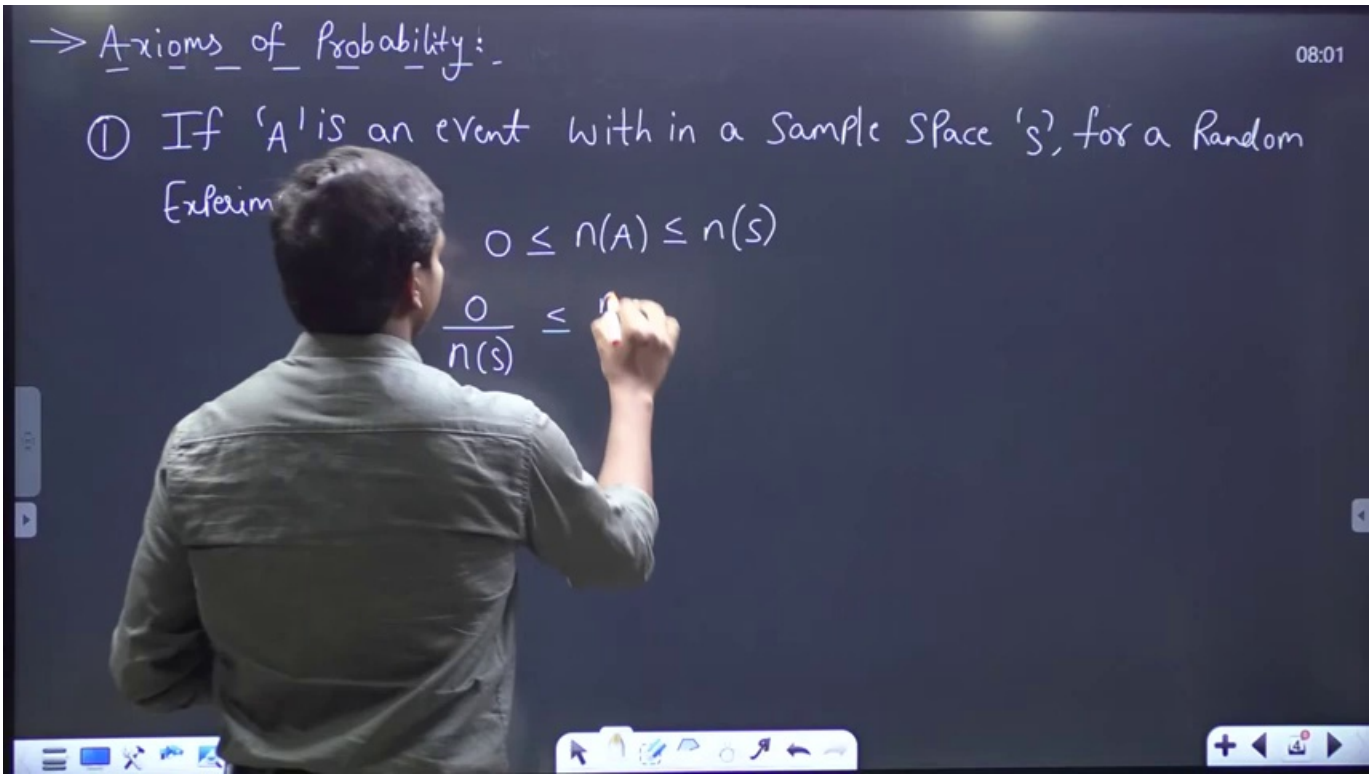
favorable case as you like you know if a is greater than zero so if you divide

this inequality with the N of yes because the N of F is not zero because

if you have F s is zero which means you are not conducting experiment okay as

long as you conduct a random experiment there will be some elements in the

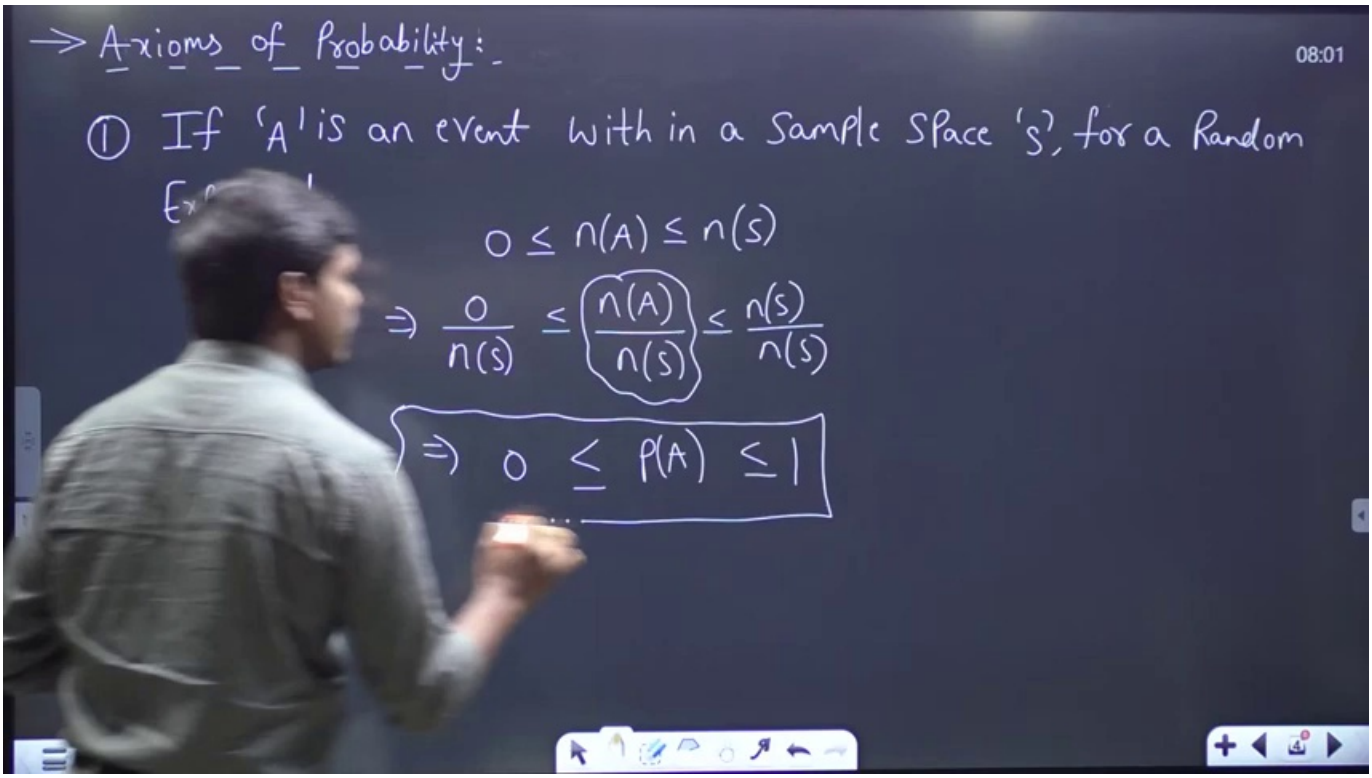
sample space of the X permit so if you see an avi a divided by n obvious is



less than or equal to n of s divided by an office so if you see this is the

definition for probability of K is less than or equal to 1 and this is 0 okay so

this is always true for any event and in



exam if they are asking you for probability of some even

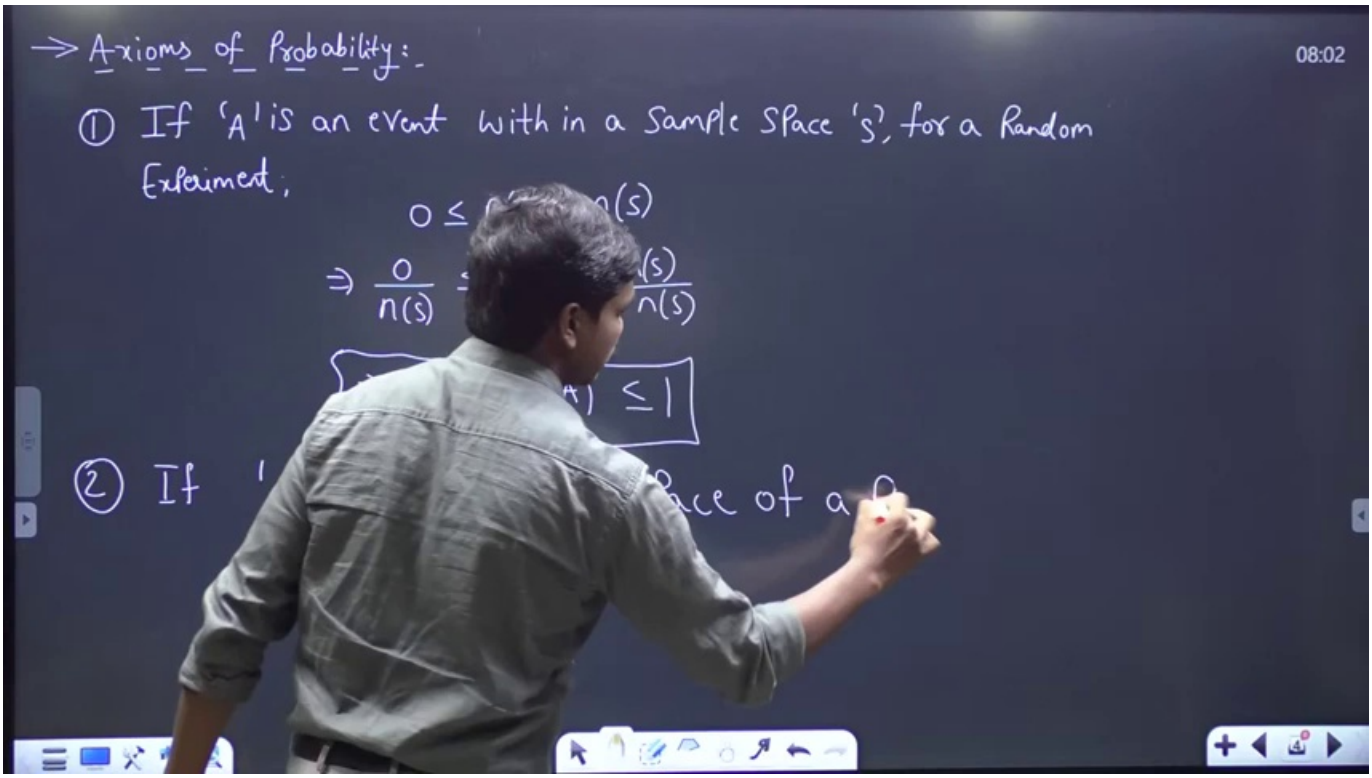
and if you are getting answers more than one you should definitely check for your

calculations okay because probability of any event always lies in between zero

right one okay next yes let me shorten this a bit

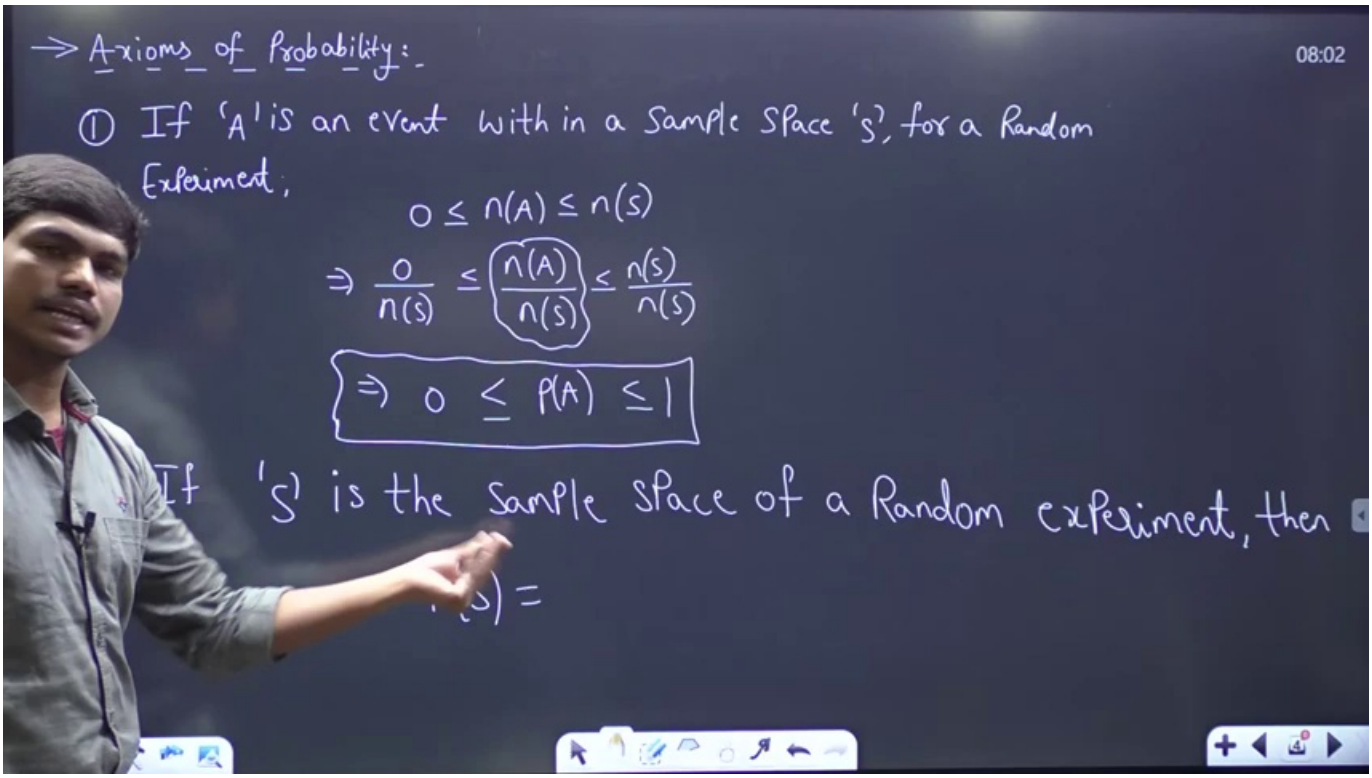
so you could see the things okay next yes yes is the sample space of a random

experiment if yes is the sample space of a a random experiment if yes is the

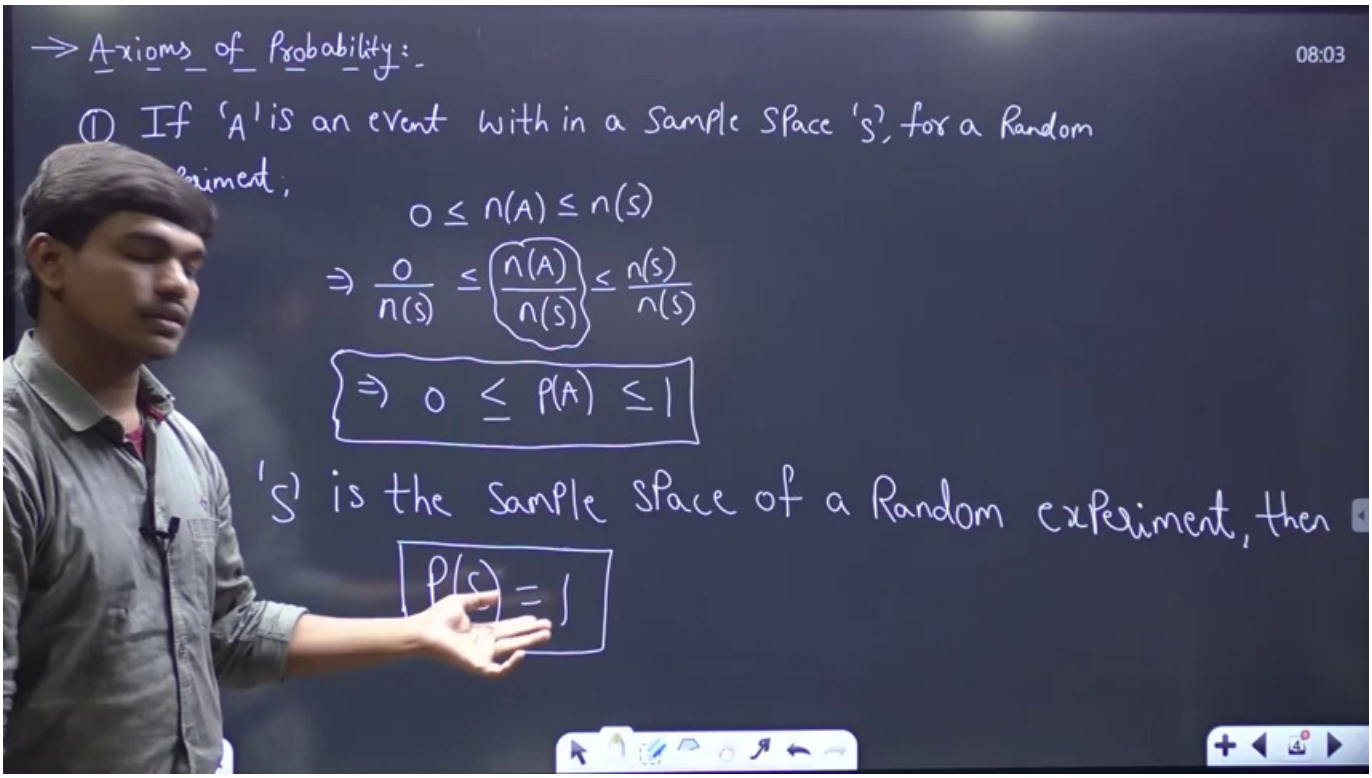


sample space of a random experiment then P of yes is equal to how much means

probability of sample space means if you take the event as any element in the



sample space then what would be P office means basically this definition if you see yes itself is a event then Y n of s divided by n office what could be the answer for this one so this tells you that when you connect a random experiment definitely one of the outcomes within the sample space really definitely occur okay so that's why a P



of s is equal to 1 which means whenever you conductive and extreme and they will

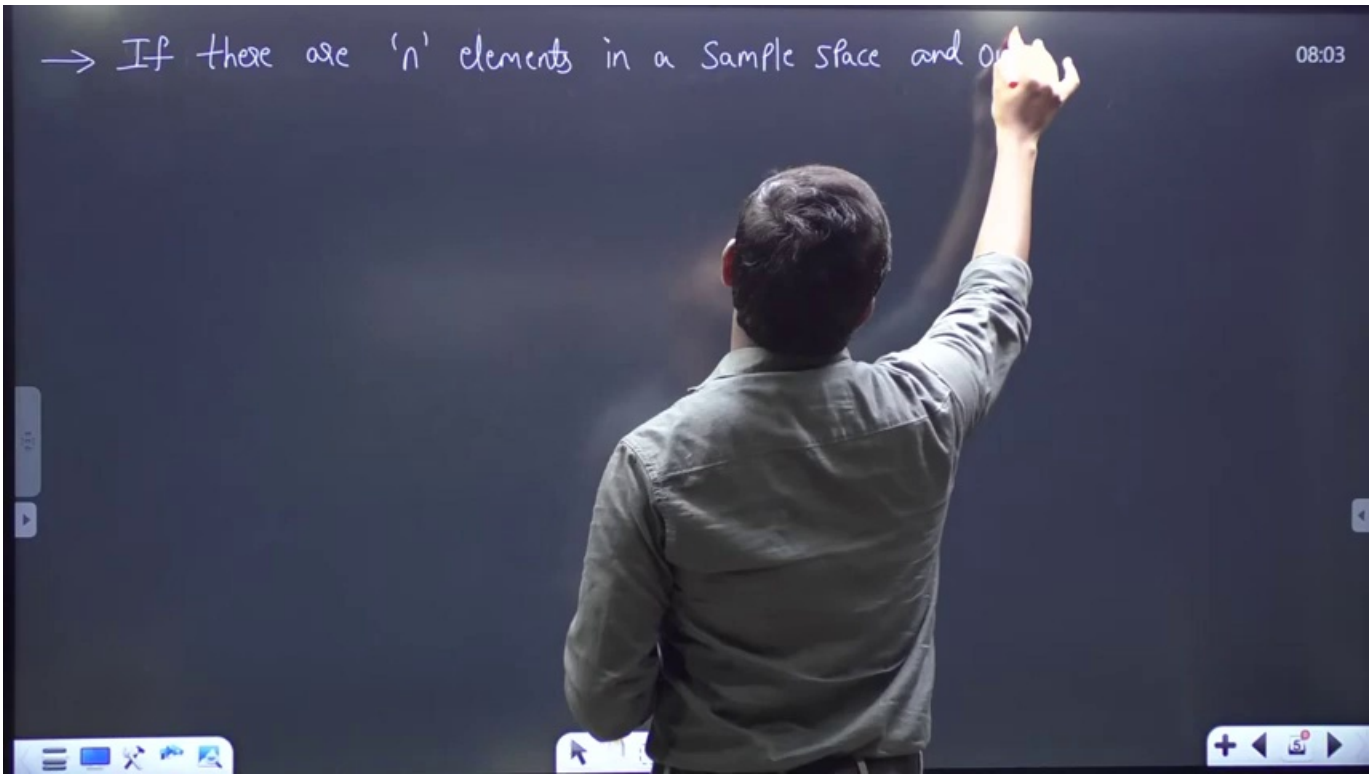
be definitely an outcome and it's obvious as long as you can't keep on

connecting some random experiments your outcomes are always present okay so next

I want to tell you one definition here which was not asked nowadays but you

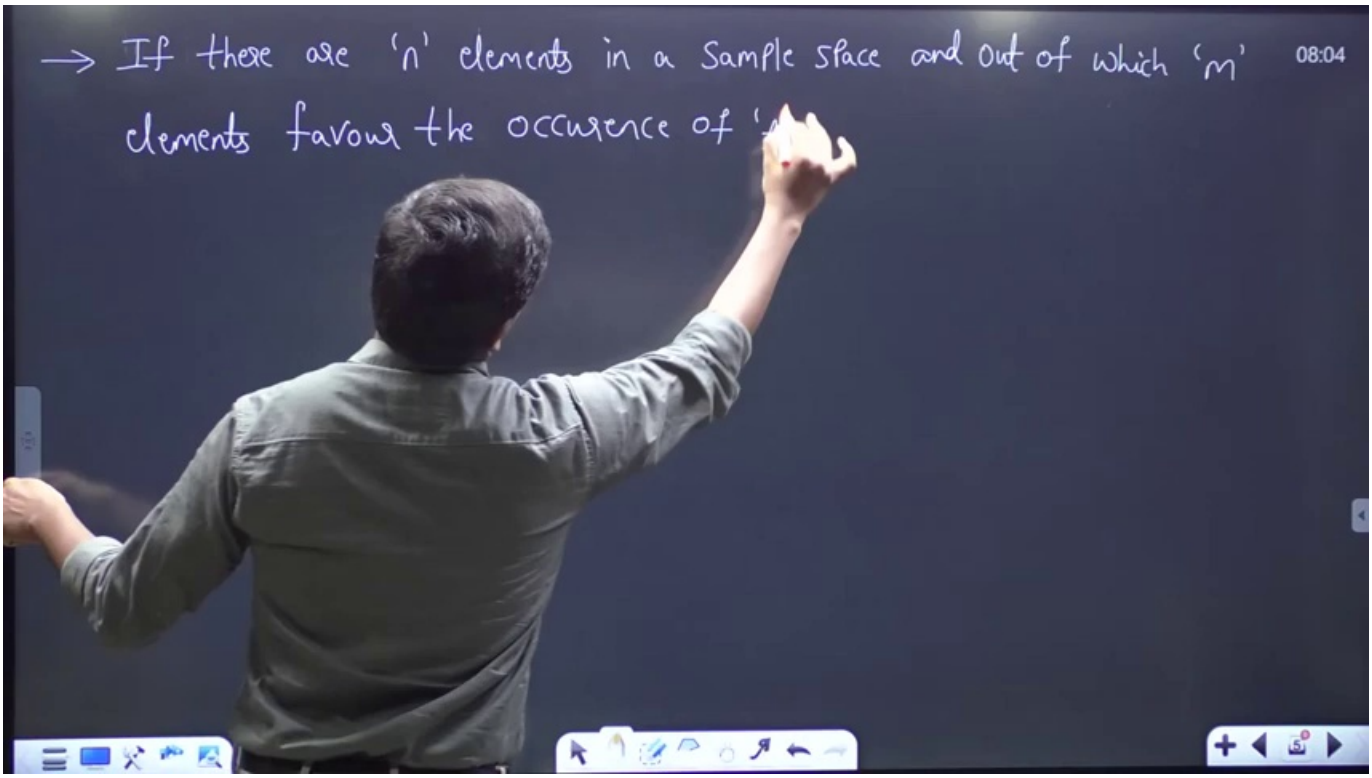
know it's in gates actually so if there are n elements

in a sample space and out of which out



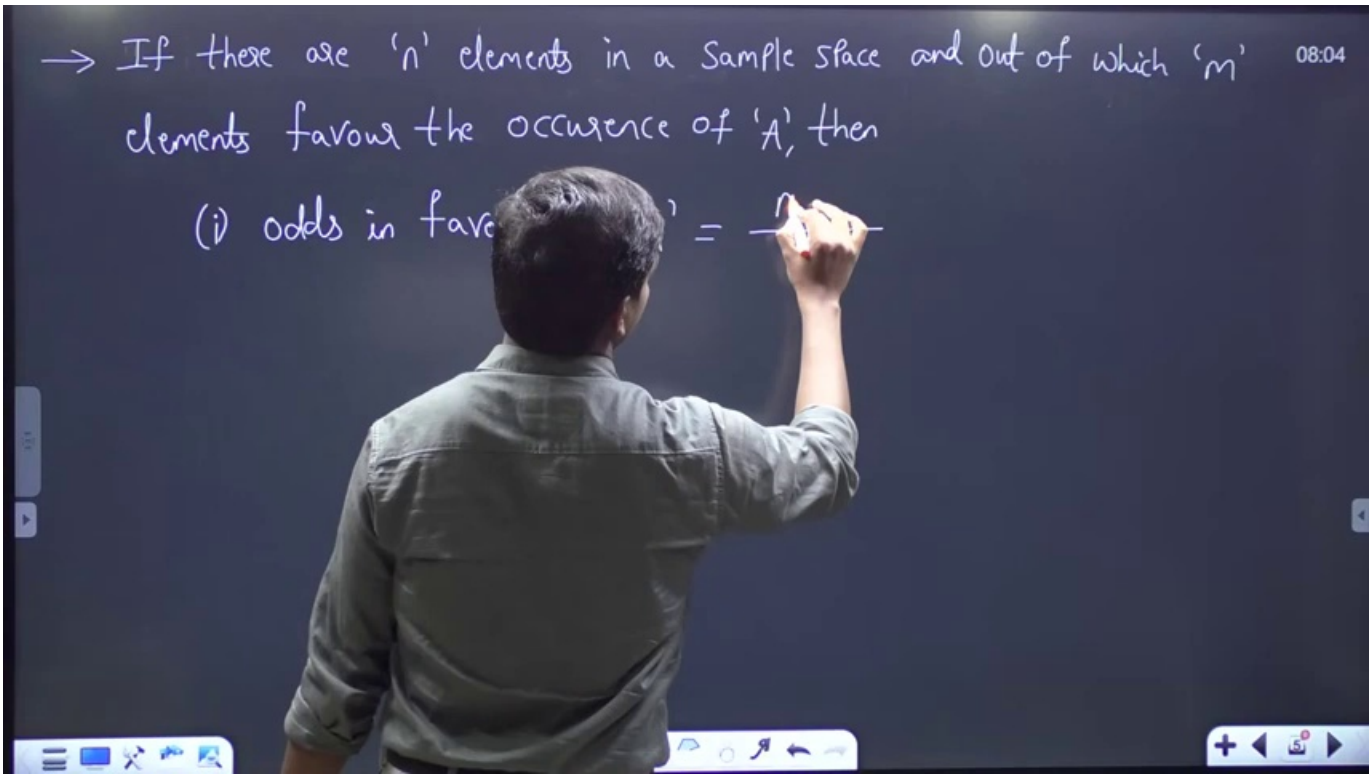
of which young elements out of which m elements favour the occurrence of a

sever the occurrence of a then then



first odds in favor of a odds in favor of a is written as he n / soul young

beside so young / young - II basically

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