Probability

One coin tossed

Sample space = {H, T} # equally likely event

Probability of head = ½

Probability of Tail = ½

One die is thrown

Sample space = {1,2,3,4,5,6}

Possibility: P(1) =

Probability: P 1 or 6) = 2/6 =1/3

Probability: P(2 and 6) = 0 / 6 # Mutually Exclusive event one die cannot give two outcome 2 or 6 at a time it give only one outcome

Probability: P(even) = 3/6 = 1/2



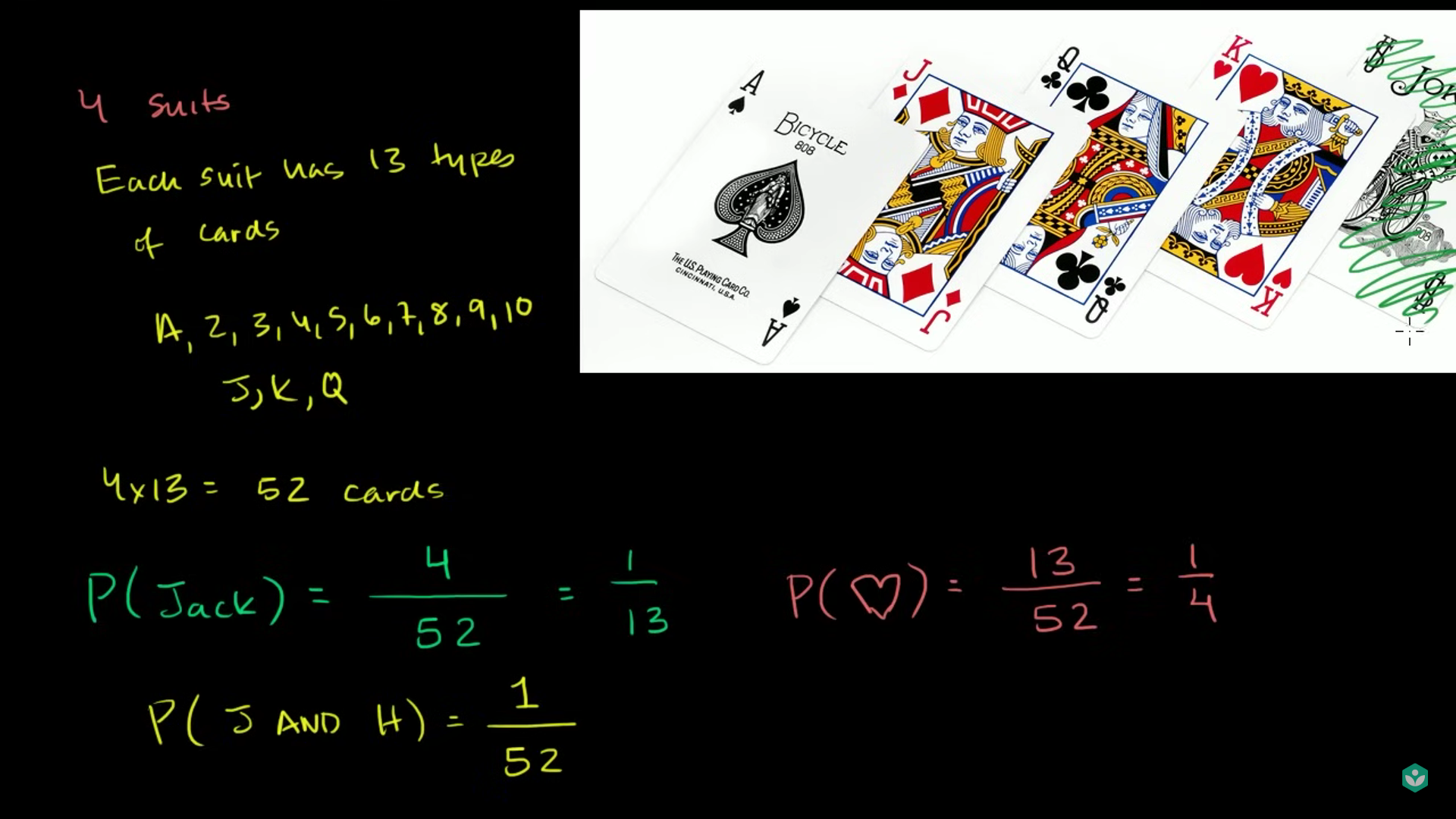
Lecture Two

A Deck of cards

Have 4 suits of heart , spades , club(leaf), diamond

Have no of cards

A, 2,3,4,5,6,7,8,9,10,Jack, King, Queen



4 suits or sets means of 13 cards = 4 \* 13 = 52

Probability of getting jack

P(Jack) = 4 / 52 = 1 / 13

Probability of getting jack and heart

Means the cards meet two condition it is jack or comes under heart

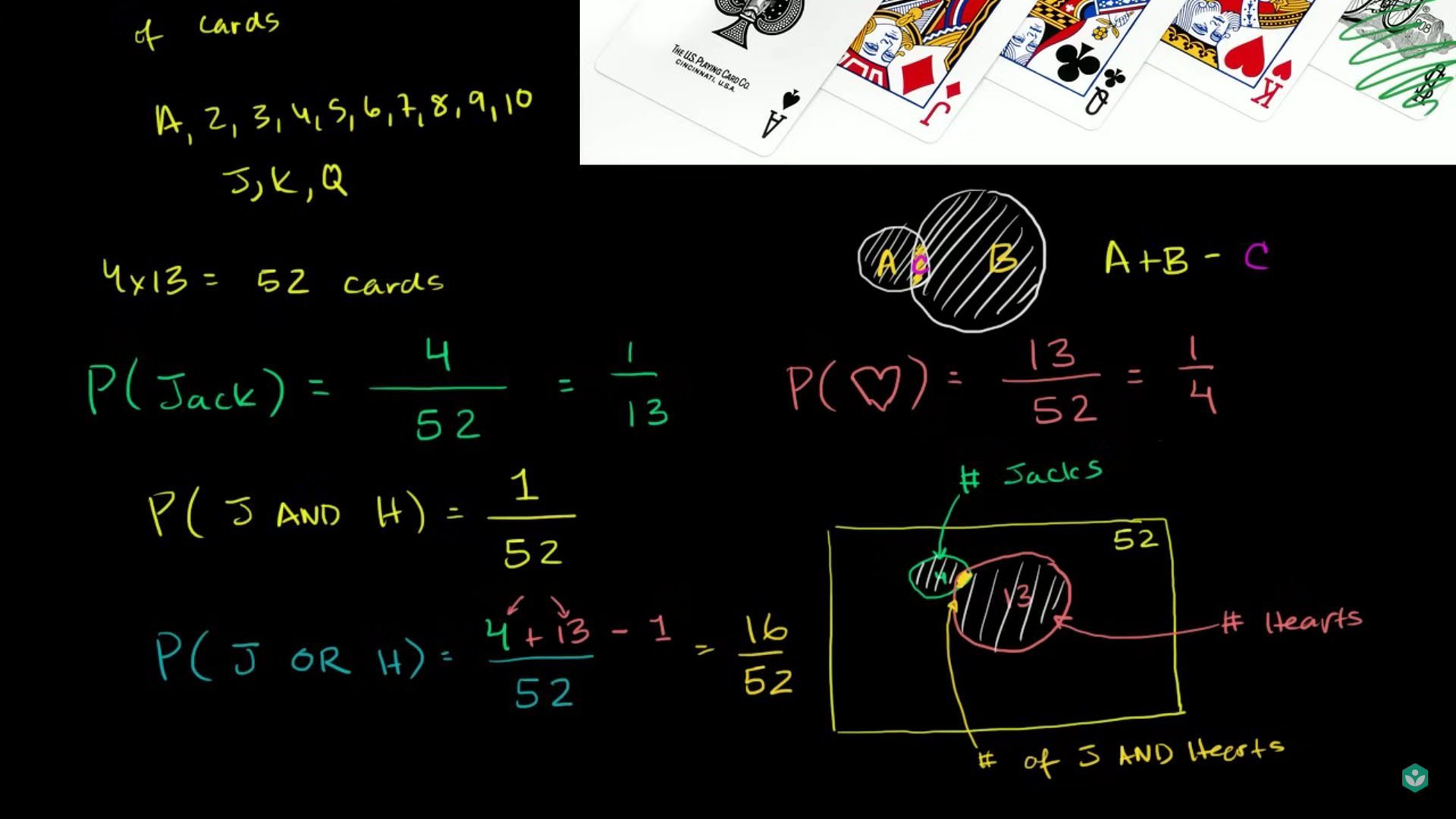
P(J and H) = 1 / 52

Probability of Jack or heart

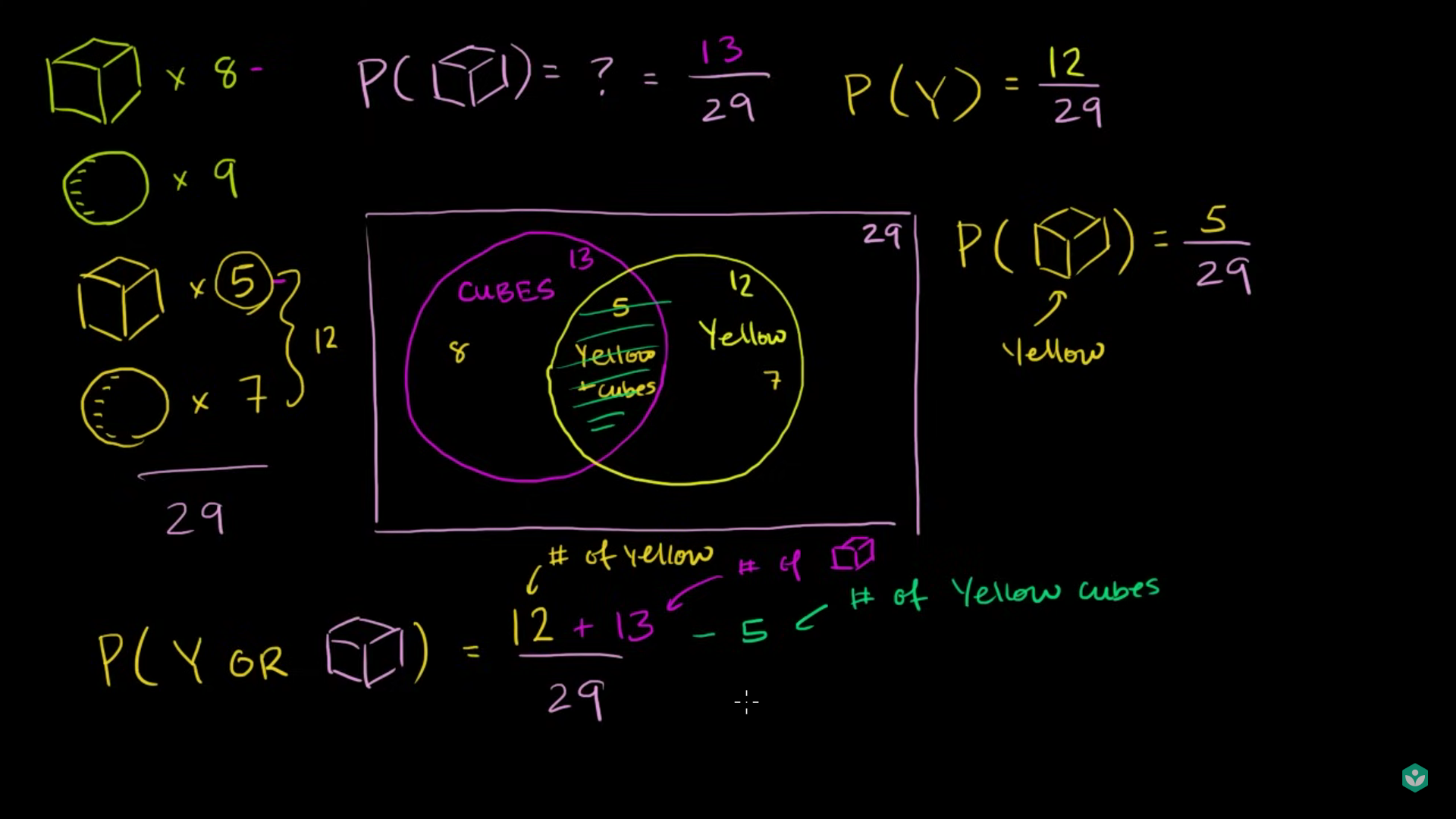
First count no of jack = 4

No of heart = 13

In vendiagram it show if we count both the common count twice means the card which meet both criteria count twice



Lecture 3: Addition Rule for probability

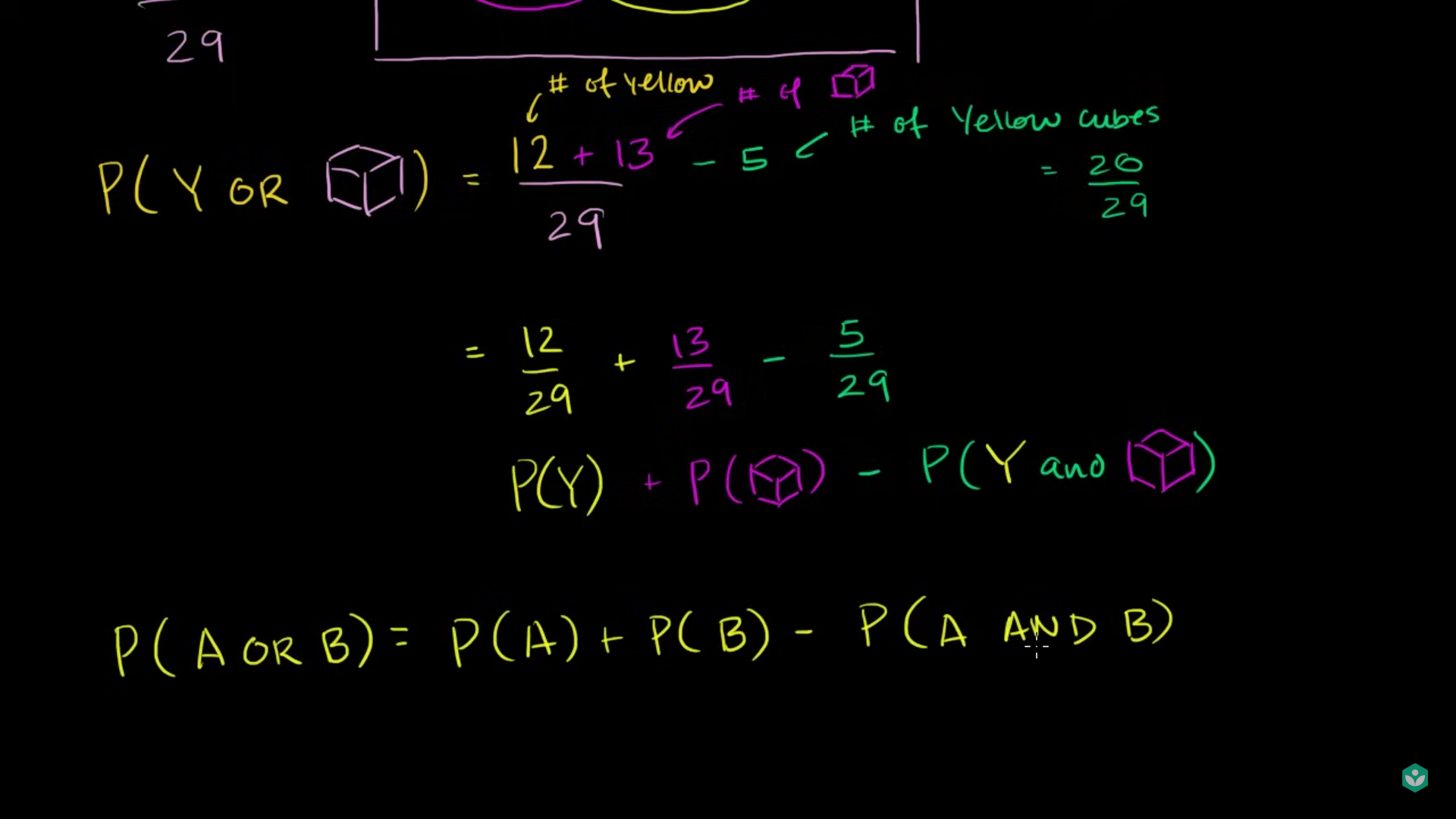


Lets consider we have 8 green cube and 9 green sphere , 5 yellow cube and 7 yellow sphere

Probability of yellow =

Probability of Cube =

Probability of Yellow Cube =

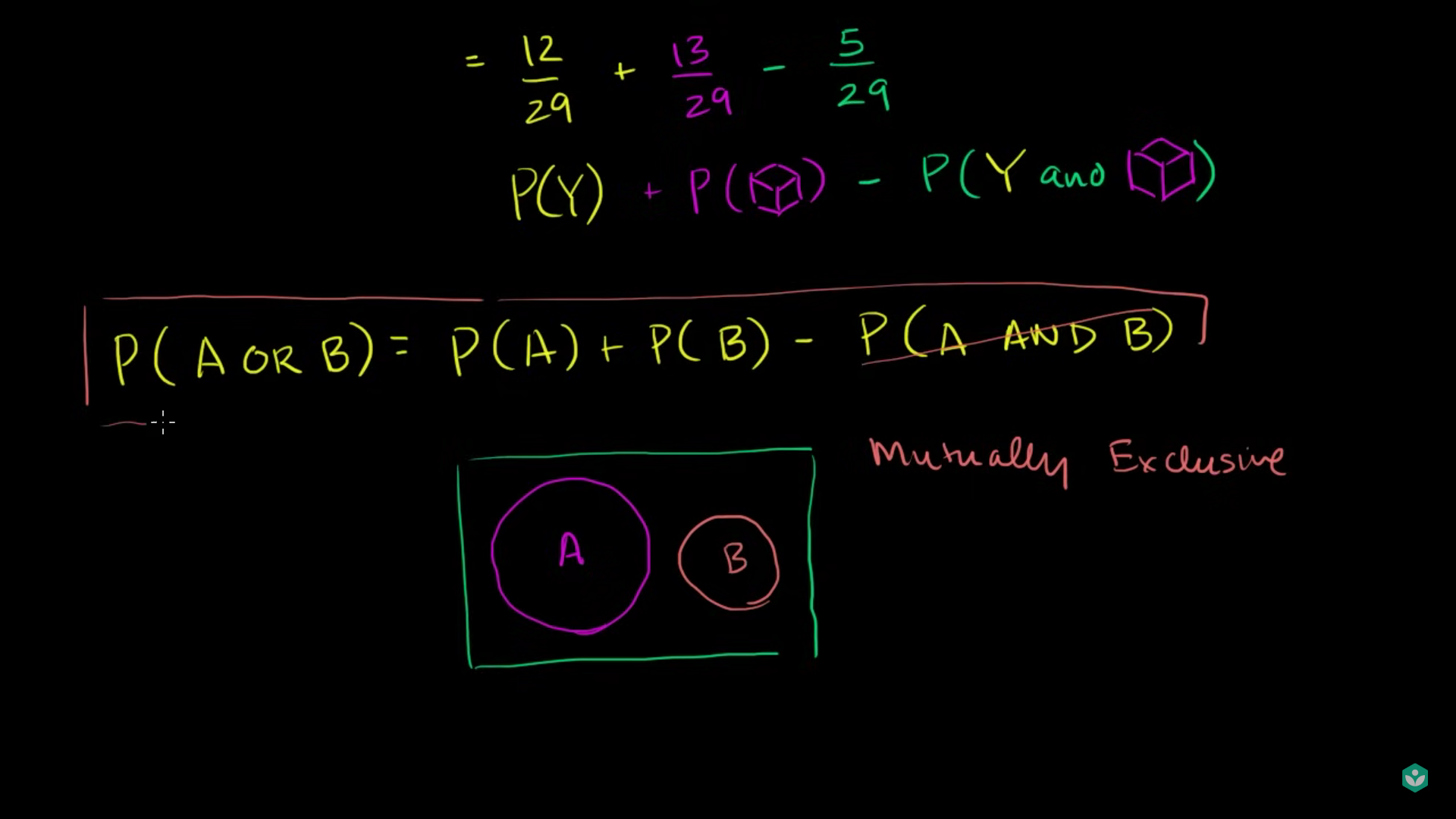


Lets calculate probability of (Yellow object or cube)

Addition Rule of probability

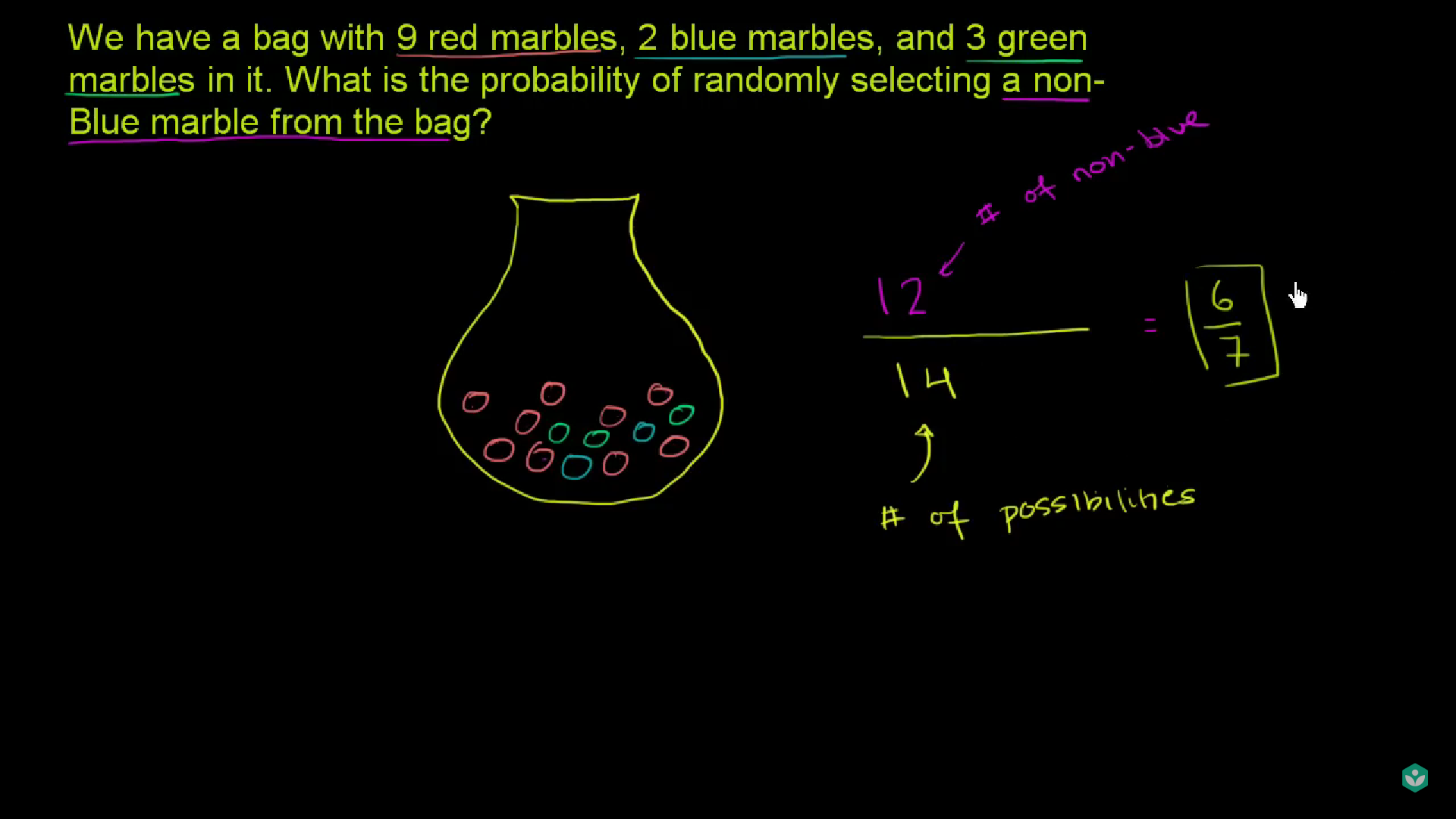
A and B are present in both

If any element are not common we say mutually exclusive or else we say mutually inclusive



Exercise

Question One



Question Two

If a number randomly choose from list what is the probability of that the number is a multiple of 5

[32,49,55,30,56,28,50,40,40,45,3,25]

Question Three:

The circumference of circle is contain in that circle is a smaller circle with area . A point is selected at random from inside the larger circle. What is the probability that the point also lies the smaller circle.

Radius calculation for larger circle

For larger circle we get

For smaller circle

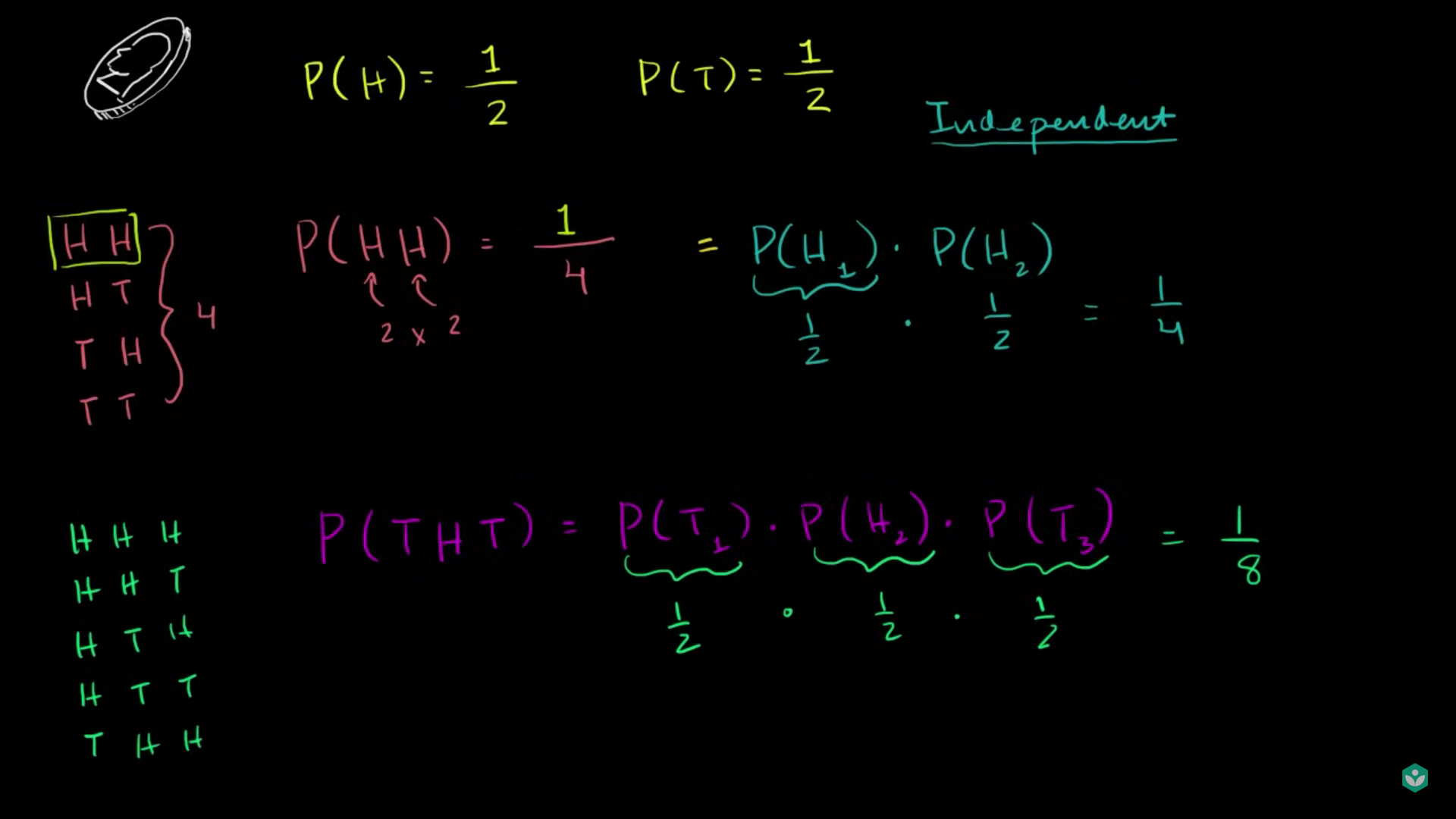
Smaller circle =

Now Area of larger circle is

Area = 324

For smaller circle

Lecture 4: Compound Probability of Independent Events



If a completely fair coin is toss the probability of head is and probability of tail is also

So if two coins are tossed

N = {HH, HT, TH, TT}

What is the probability of getting HH

P(HH) = both head are completely independent event the first coin outcome does not affect the second one.

P(HH) =

What is the probability of P(HTH)

Lets say this are completely independents events are there so,

N = {HHH, HHT, HTH, THH,HTT, TTH, THT, TTT}

It is 1 of 8 equally likely possibility

Exercise 2: Coin Flipping Probability

Fair coin flip three time

N = {HHH, HHT, HTH, THH, HTT, TTH, THT, TTT}

Question 1:

Probability of at least one head

P(at least one head for three toss) =

What happened if it say 20 toss it would be difficult but it is equiveelnt of probability of not getting not all tails

P(not all tails ) or p (all tails ) = 1 # it is mutually exclusive event not occur at same time

P(Not getting all tails in 3 flips) = 1 – P(TTT) =

Question 2:

Probability of at least one head in 10 flip

P( not getting tails in 10 flips)

1 – P(10 tails in row)

99.9% chance at least one head

Lecture 5: Probability without equally likely events

P(A) = # this all about unbiased or fair coin

Now if we toss unfair coin there is a probability of getting head is 60% chance or tails is 40%

What is the probability of getting head, tails are calculated

