Okay, we're back here to start thinking about how to perform calculations with, rather for a binomial distribution.

So we're going to do things using R. Now R is not something that I brought up, at least in terms of showing the use of in previous videos, but we're going to start using it here, and moving forward. after we get into the next course. One of the things about R is it's it's open-source. It's completely free. And it's got a really, really strong community. Maybe too strong at times. But we're going to take advantage of using R for these calculations moving forward.

In classes that I teach normally, we use graphing calculators particularly the TI line. So there's the TI 83 and the [TI] 84 are kind of the most popular right now. Those calculators still run about a 100 bucks. So I didn't want to make that requirement for the class, even though they are rather convenient for a lot of, a lot of issues. But still R is useful.

So when you are doing the practice problems and the final assessment for Lesson J, I fully expect you to use R. So maybe have another window open, using R.

When it comes to R, my screen's going to look a little different than your guys' [screens]. One of the reasons is because I am using the version installed on my local machine. I'm, I'm not going to use the AWS version for videos. And the reason for that is because it gets a little clunky. It looks a little strange and it's a little slower. And so I want to maintain a little bit of speed with the videos but they function the same. But the, the AWS virtual machine that you're using will be convenient, so you don't have to worry about the installation and all that other stuff on your local machine.

So we're going to still refer over to R, but mine will look a little different. So I'm going to Alt- Tab over to R right now. [I guess not Alt-Tab, I'll just select it.] So my screen probably looks a little different than yours. I change the color just because its more visually appealing to me to have a dark background rather than the white background. And then I increase the font size just so it's a little easier to read. But beyond that it's basically the same thing.

So R is a scripting language similar to Python. So it's, it's interpreted, it's not compiled. So it's, it's a little, in my opinion, a little easier to use than a compiled language like C or Java or something like that. There's a lot of convenience that comes with R. So the only thing we're going to deal with at the moment is the binomial distribution. So we saw in the last video that the formula is a little complicated and so to make things a little more convenient for us, we're going to just do all our calculations in R.

Now if you ever have a function, or I'm sorry, a question on a function, rather, then there is a bit of help. So whenever you need help on something you just have to type question mark and then the name of the function. So this can be a little hard because if I type question mark [?] binom it comes up binom.test, it will autocomplete. But if I do that, it's going to say oh there's no documentation. If you do two question marks and then binom Then it will search all the functions for the for the function and it does auto-complete. [That's kind of annoying.] But when I hit Enter it'll take a minute. It's searching basically everything.

So it, down here in the Help window, there's a similar package that I've installed like caret and some other stuff, maybe we'll look at. You can look through and see kind of like everywhere binom comes into play. So there's quite a bit here. But if you go all way down to stats binomial, and I click on that, it'll bring up the binomial distribution. This is the stuff that I had printed in the guided notes. I basically copied and pasted most of it.

So it notes here that there's two parameters the size and prob. Those are N and P respectively. The number of successes is going to be X or well, we'll look at other issues here. So, so there's four functions for the binomial distribution. We can look here dbinom, pbinom, qbinom and rbinom.

I'll hop back over to the guided notes here to talk about that. So basically this is part of the output that to, or part of the help file.

The only two we're going to use for this class are going to be the first two, dbinom and pbinom. dbinom is basically going to be our PMF function and pbinom is basically going to be our CDF function.

So we talked about the PMF and CDF in the previous lesson. Where the CDF is summing up values from the left. And the PMF is just the probabilities for individual values of your random variable. So these are the two we're going to use. Underneath the functions and the syntax there are the arguments. So those are the quantities that you have to specify to feed into the function for it to spit out a value.

So we'll look at those here in a moment. If we looked under at the details, this function right here is basically the function that I posted in the previous video at the end of the previous video. So that choose N X is basically the N choose X there. And then we have P to the X and then 1 minus P to the N minus X. So it's just saying that that's the PMF of the function and it's valid for X values 0 through N. So that's pretty much what we've dealt with. So we'll look at a few examples in the next video.

I will initially going to kind of combine these but I wanted to leave this separate just to talk about R. So everything we do and examples 2 and 3 are going to involve using R to do the calculations. And so I'm not going to do them by hand. I encourage you if you're interested to compute the probabilities by hand to make sure they correlate with what we get from R. If you have time, I think it's a useful exercise but not required. So in the next video we'll take a look at examples 2 and 3, and I use R to do the calculations and kind of examine things a bit. So we'll catch up then.