

Hello students, how are you all? I hope you all are fine. In this video, we are going to discuss the second use of z-test. In which type of question can z-test be used more easily? And what is the formula related to it? Or we can convert it into an easier formula. In the last video, we saw how to find the number of success or how to test for the number of success. Today in this video, we will discuss to test the proportion of success. We can also check the proportion of success. We can also check the lower to upper limit of success. How much it can fall down and how much its success in the ratio or percentage can go up. Let's talk about those things. Welcome to Gate Smashers. My name is Ankit Rodha. Without any delay, let's start. First of all, see what formulas we need here. That is SE. Now SE means Standard Error of the Mean. What is the meaning of SE? Here we are talking about standard error. We saw this in the last video also. Standard error of mean. And you can also say that standard error of the mean of success. How much standard error is there in it? There can be an error definitely. Where P is the notation for the probability of success. Q is the notation of probability of failure. And N here represents the number of samples. That is how many samples we have chosen. And if you want to find the limit in the proportion. That is, to find the lower and upper limit. Then we will use the formula  $P \pm Z \sqrt{\frac{PQ}{N}}$ . Where P stands for the probability of success. Z is the value of Z test. We used to find the value according to the table. And if we do not have the level of significance given. Then by default we will take the level of significance. Let's check the question. It will be clear. See, the question is. 1000 bulbs purchased from the shop. And 100 are defective. Estimate the proportion of the defective bulb. What is its proportion? We have to talk about the ratio. We have to talk about the percentage. Then assign the limit. That is, take out the lower and upper. Let's start. If I have a sample of 1000. Then the logic is that what is the value of N? It is 1000. If I have N, then it is 1000. And if I say 100. My P is talking about the probability of success. And if the success itself is defective. Then what is the probability of defective? 100 divided by 1000. Which is equal to 0.1. So if the probability of success is 0.1. Then the probability of failure is minus 1. 0.9 is there. First of all. Let's talk about the error. I will get the error. Square root of. Here we will keep the formula in mind.  $\sqrt{\frac{PQ}{N}}$ . P is equal to 0.1. Q is equal to 0.9. Divided by N. Where N is 1000. So what is the answer here? 9 divided by this. That is, the square root of 9 divided by this. Which is equal to 0.12345. This. So let's solve its square root once. The value of the square root is 0.0095. Proximate. We solved the square root. Its value is 0.0095. Whose value did we get? The value of the standard error. If I talk about the limits here. That the lower limit. The proportion of success. Let's talk about the proportion of success. What is the lower and upper limit? So what will be the formula?  $P \pm Z \sqrt{\frac{PQ}{N}}$ . Which is the probability of success. Plus minus. What will you put as Z? The standard value is 0.05. And what value does Z give at 0.05? 1.96. See the table. I uploaded it in the last video too. You will also get the link in the description. And what is the value of this now? Standard error. That is multiplied by 0.0095. So 0.1. When you multiply both these numbers. The answer will be 0.0186. So once you add both the values. That is 0.1 plus this. It will be 0.1186. Right? And once you subtract from 0.1. After subtracting, the exact answer will be 0.0814. Now you are talking about the numbers. Now if we change it to percentage. Multiply by 100. Here it will be 8.14%. Lower limit came. And here it came 11.86%. That is the proportion of success. Decide its limit. So in Z value, today we discussed. Actually, the test Z can also find the proportion of success. Now whether it has given two cases, two samples. Or it has given you one sample. And we can also check the difference. We can also check the difference of the proportion. That is our next video. In that I will tell you the formulas in an easy way. Where we can find the difference. See, our main logic is to do the test. I have already told you this. T test, Z test and your chi-square test. You are getting its recorded videos. Just to clear the topics. In the recorded lesson, we are clearing the concepts. Because you were facing problems in the live. So different types of test. Whatever I am doing, whatever formulas I am doing. We will always keep these files in mind. We will always keep these formulas in mind. Formulas and file links. You will get all the links in the description box. In today's live class, we are going to discuss. Discussion on the sample paper which was launched a few days ago. We will discuss on that. From which portion did the part come. And probability and statistics. All the topics we have covered. Out of all of them, I will tell you one by one. All the topics we have covered. As it is, all the questions have come. We have done everything. We will discuss in today's live class. See you in the next video. We will see the use of one more test. Have us. Good day to all of you. Bye-bye. Bye.