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Discrete Mathematics
Logic
Rules of Inferences - Part 7
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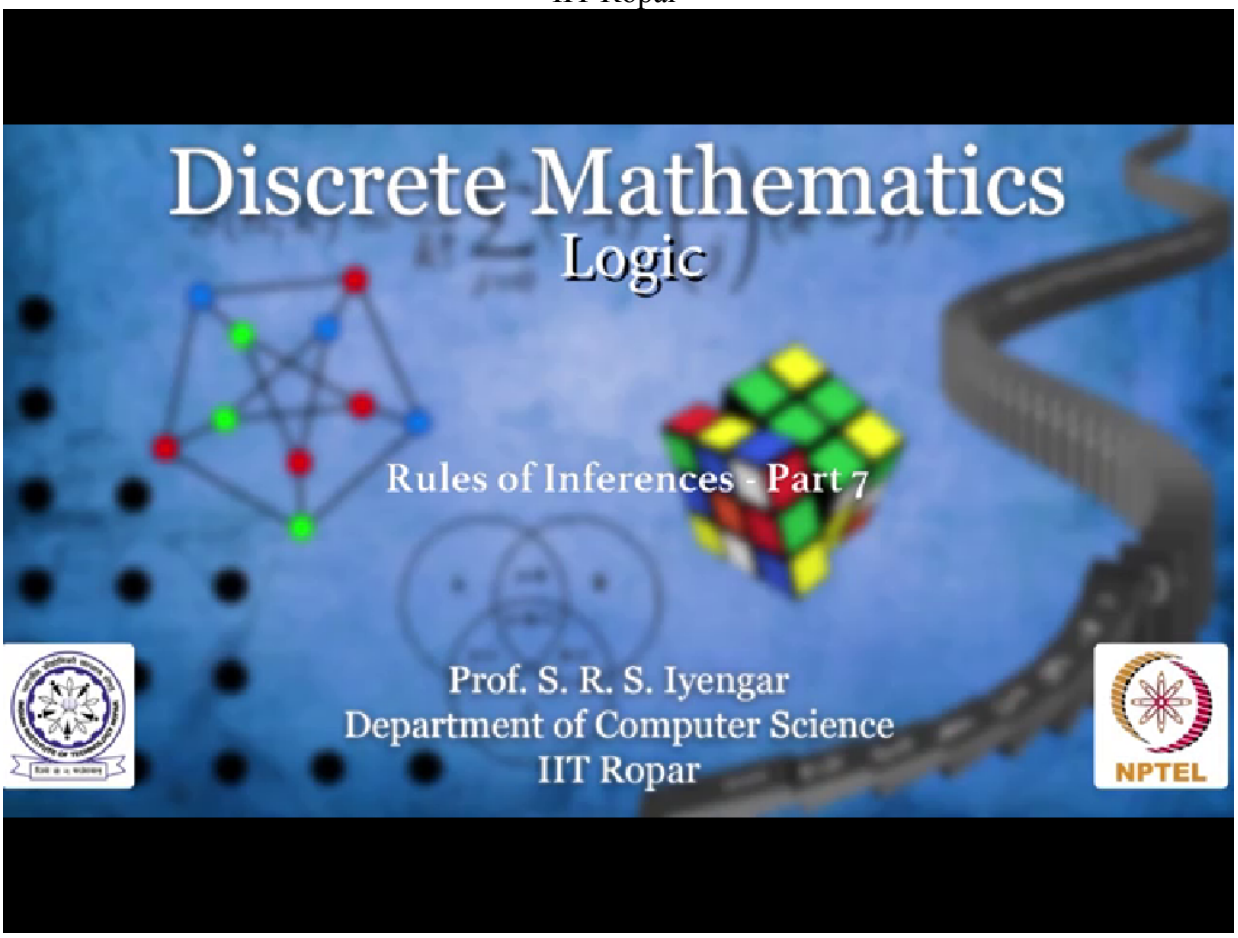
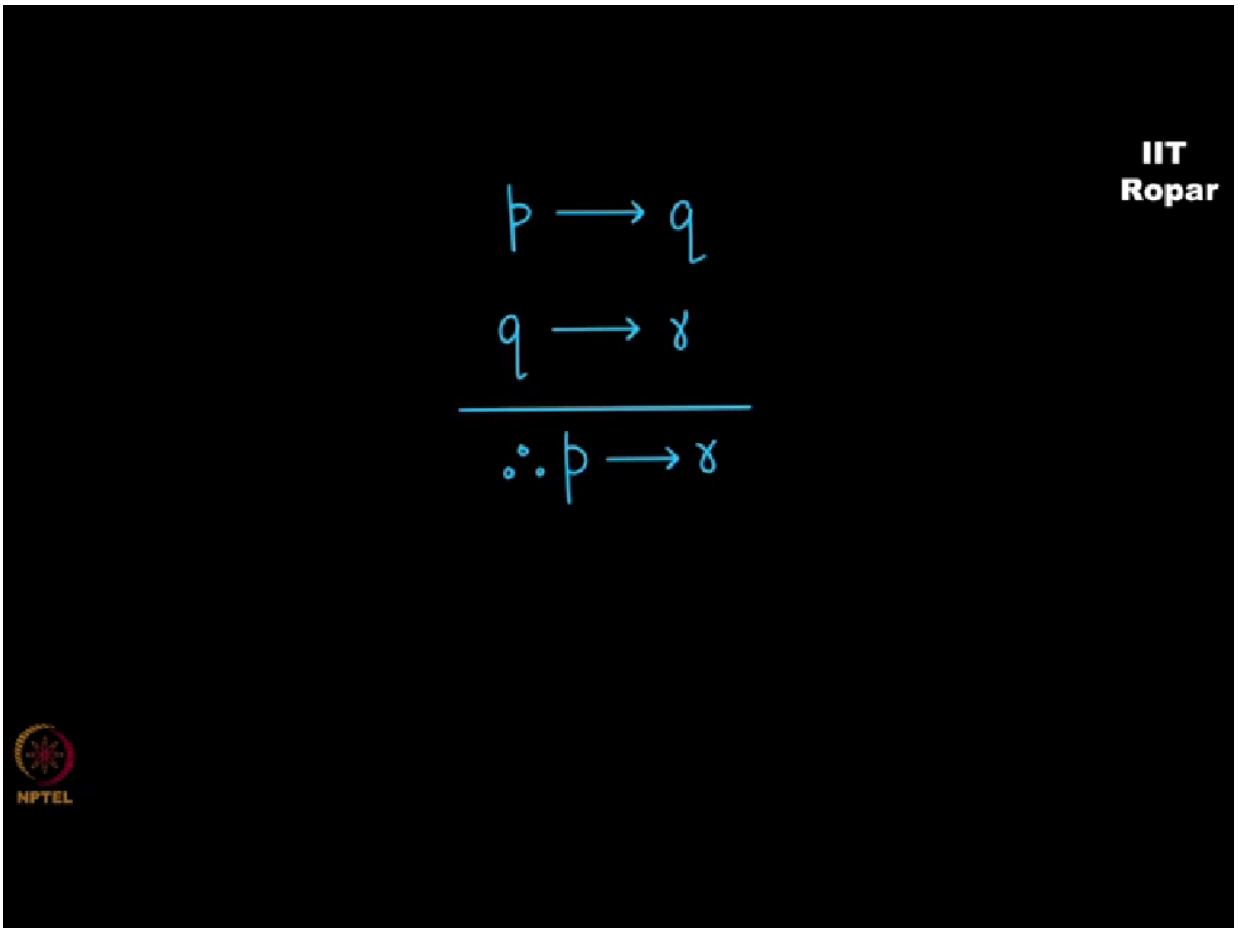
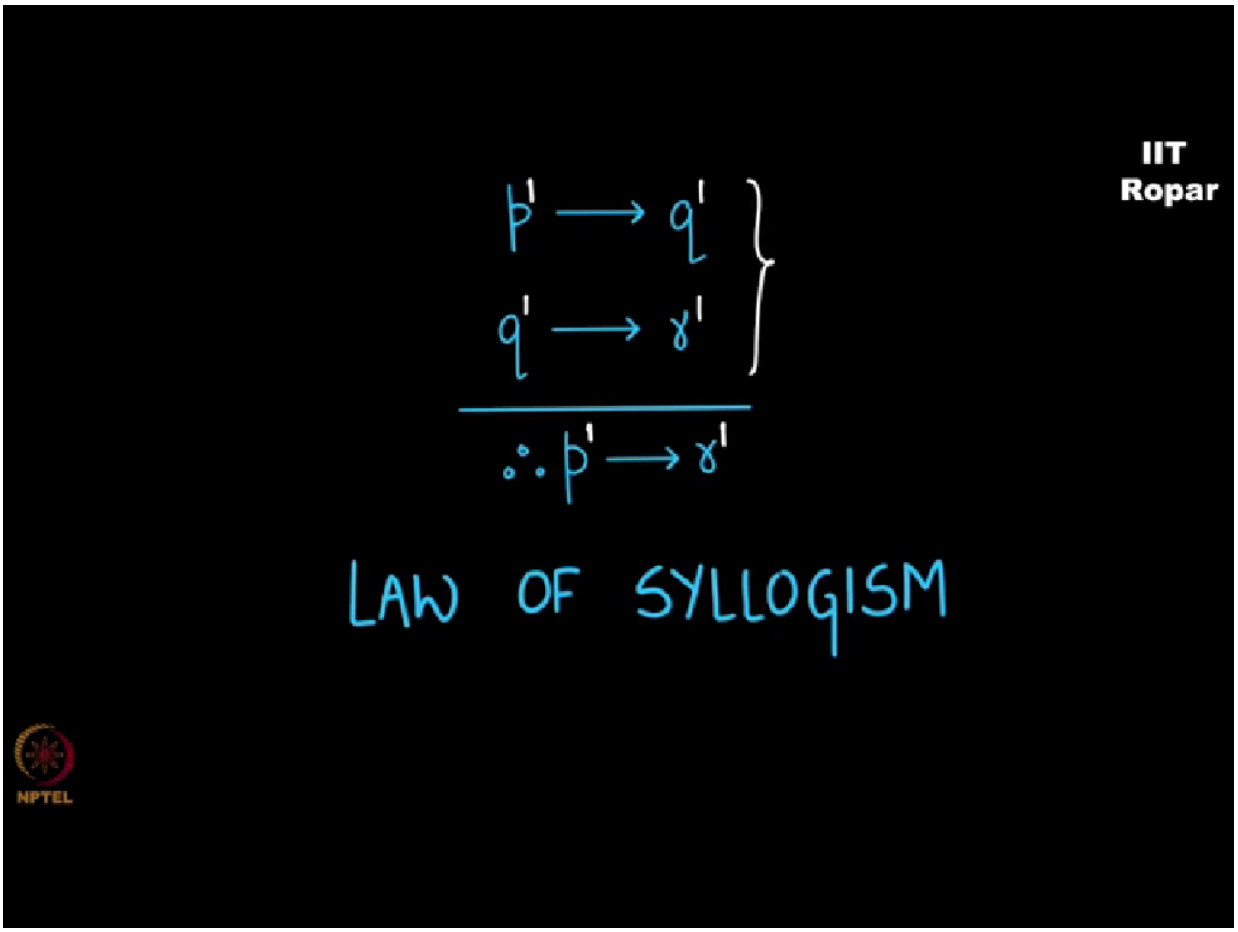



Look at this. We saw a lot of questions, but let me ask you the simplest of all questions. P implies q is given to be true. Q implies r is given to be true. What can I conclude? I say, therefore, p implies r is true.

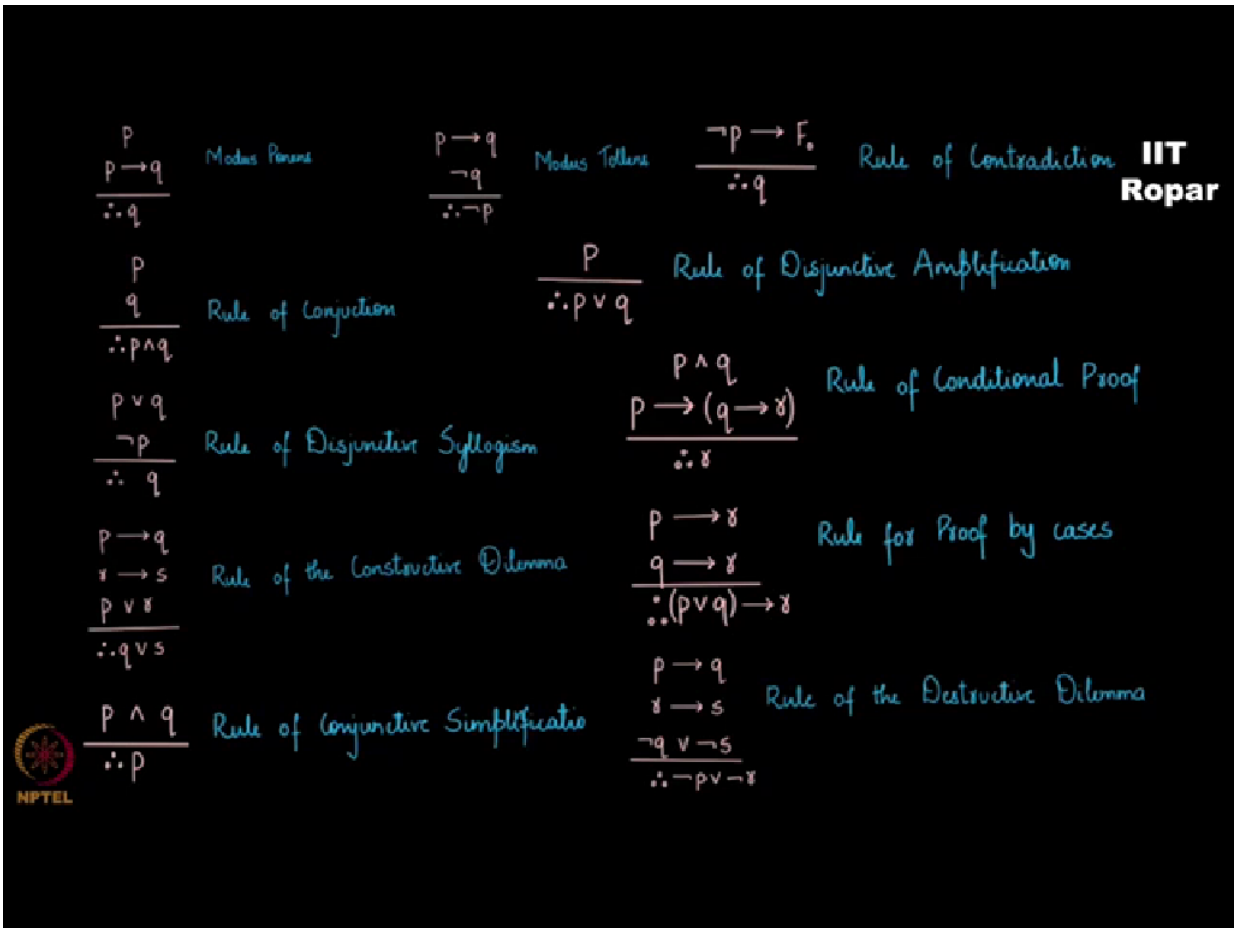



Now how do I prove this? I can prove it by the following. P implies r becomes false when p is 1 and r is 0. Let me force this here. When p is 1, q becomes 1 obviously. Q becomes 1 means r becomes 1. You cannot have 4 to be 0 and therefore, p implies r is true given these two statements. Okay.




So now this is called the Law of Syllogism. Something as basic as this has a name and you are supposed to remember this if you are part of some discrete math examination, you should – you are supposed to know this particular law. If you are asked to state it, you may have to state it. All right. Although I am not a big fan of memorizing the name of the laws and remembering what they exactly mean, but you may have to be warned that some universities might have this expectation from you.

Anyways, there are many such laws very pretty straightforward ones and here we are flashing all of them.




As you can see, most of them are quite straightforward. If you look at Modus Ponens also called the Rule of Detachment, it simply says p is true, p implies q is true, therefore q is true. You see we have seen a lot of questions. This looks like the simplest of all.

Anyways, there are many such rules roughly a dozen of them and hear are -- here we present all of them to you. It's left to you to go through them line by line and then understand it, prove them and sort of even remember them if it is required, but trust me if you are able to understand how to solve the rules of inference question, you have the wisdom of what makes mathematical logic.

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