NPTEL
NPTEL ONLINE COURSE
Discrete Mathematics
Logic
Rules of Inferences - Part 4
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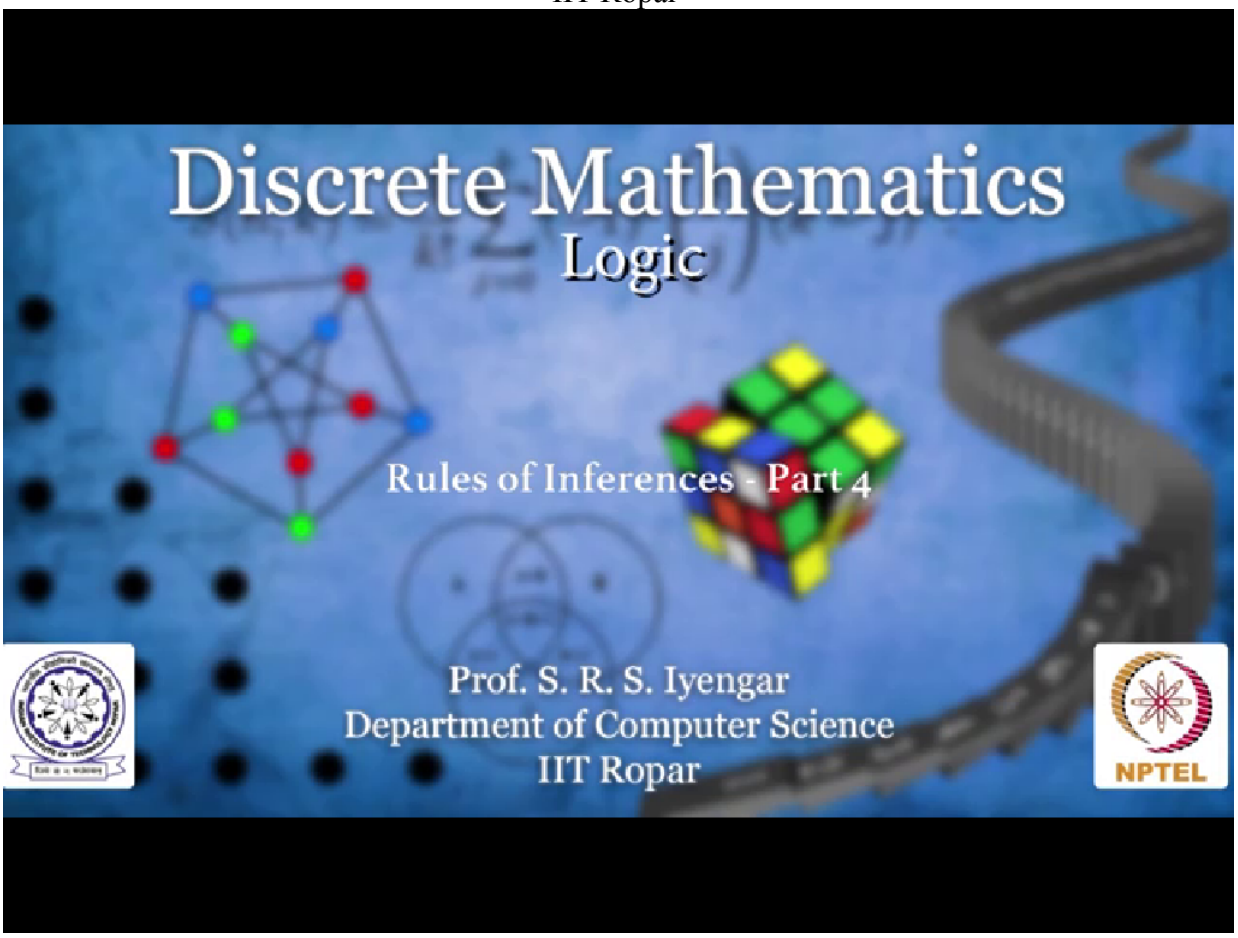
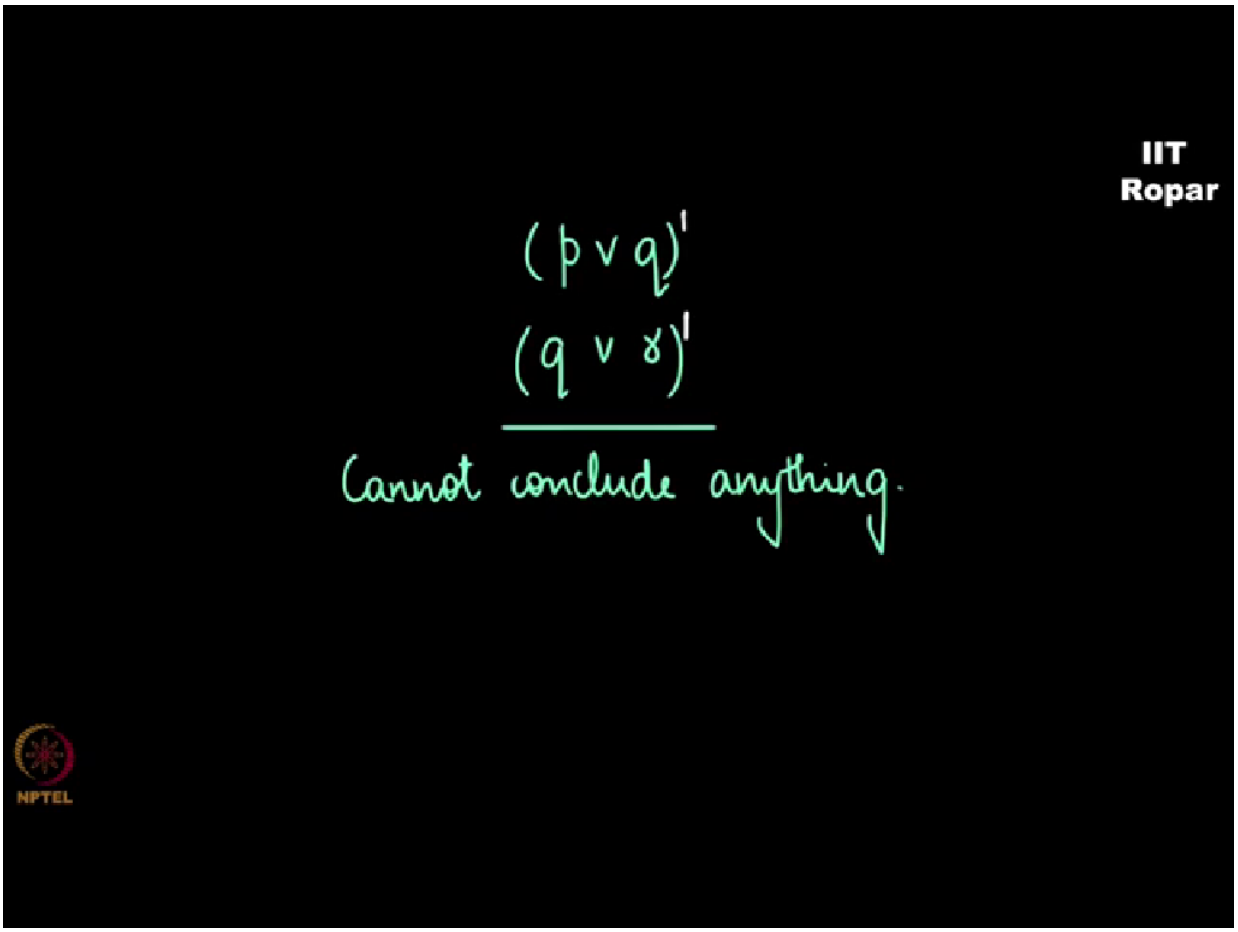
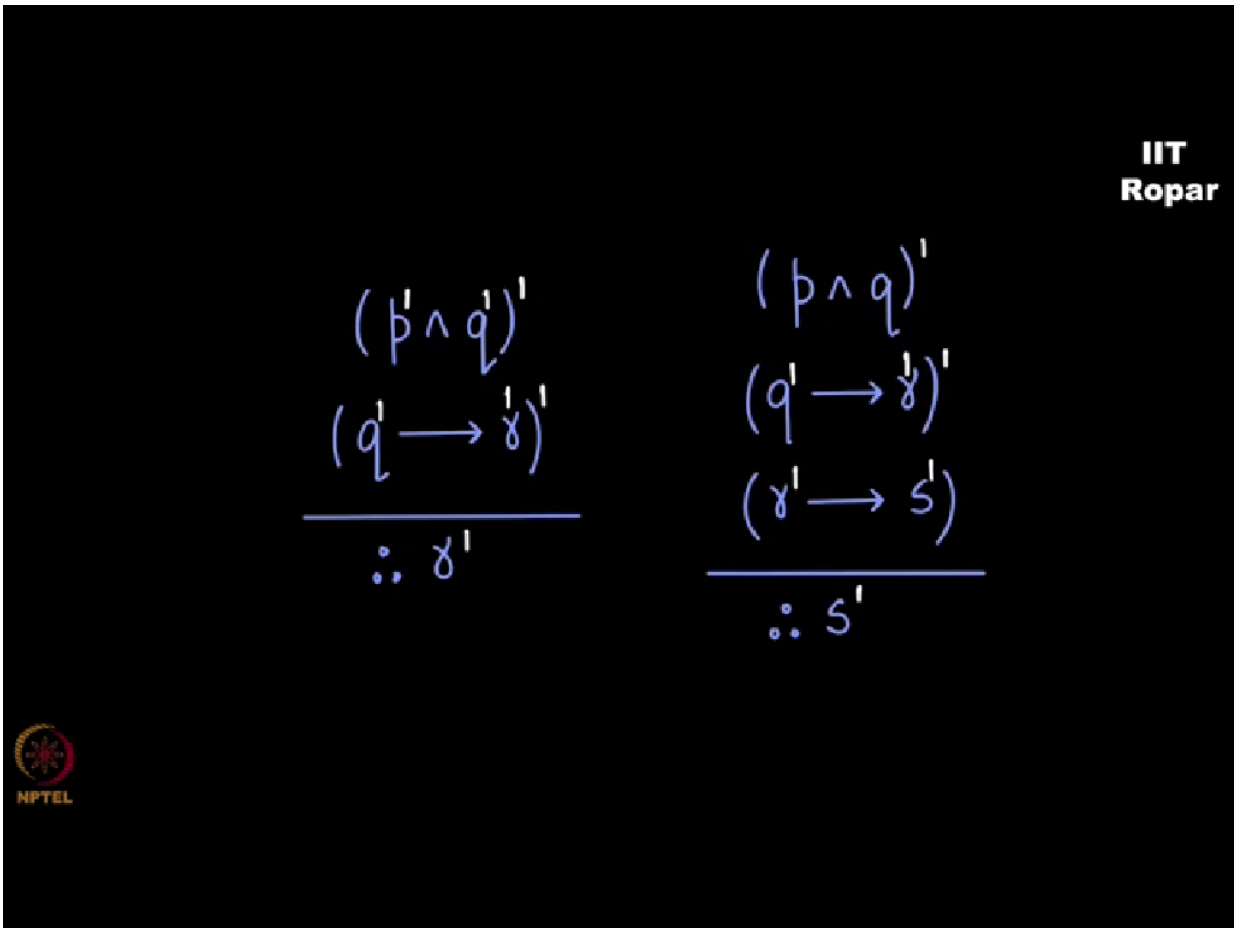


A word of warning. There could be questions where you cannot conclude anything. For example, look at this. I said p OR q is true and I also say q OR r is true. What can you say? You cannot say anything decisively about any variable here. Okay.



I will give you one more extra information. P is given to be true. P is given to be true. P OR q is true. Q OR r is true. Still you cannot conclude anything about let's say p is given to be true. Writing therefore p here is redundant. You see we already know p is true. Correct? Can you conclude q is true here? Can you conclude r is true here? Not really. You cannot.

I gave you an example where you cannot conclude that something is true. I'm now giving you an example where you can conclude that a lot of things are true as well. You see, look at this p AND q is true. Q implies r is true. What can you conclude? I am saying p AND q is true, which means p is true and q is true. So p is true, q is true, and q is implying r, which means r is true. You see, therefore, you can say that r is true here. Correct?



What if I added one more implication here? I said p AND q is true. Q implies r and r implies s. So given that p AND q is true, definitely q is true. Okay. Q implying r is true, which means when q is true, q implies r is true, which means r should be true. R is true. I can say, therefore, r. Also r is implying s. R is true, which implies s is true. I can even say, therefore, s.

You saw an example where you could conclude that something is true. You saw an example where you couldn't conclude that anything is true. Now we are seeing an example where you could conclude multiple things are true.

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