Discrete Mathematics

Functions

Cardinality condition in One-One function - Part 2

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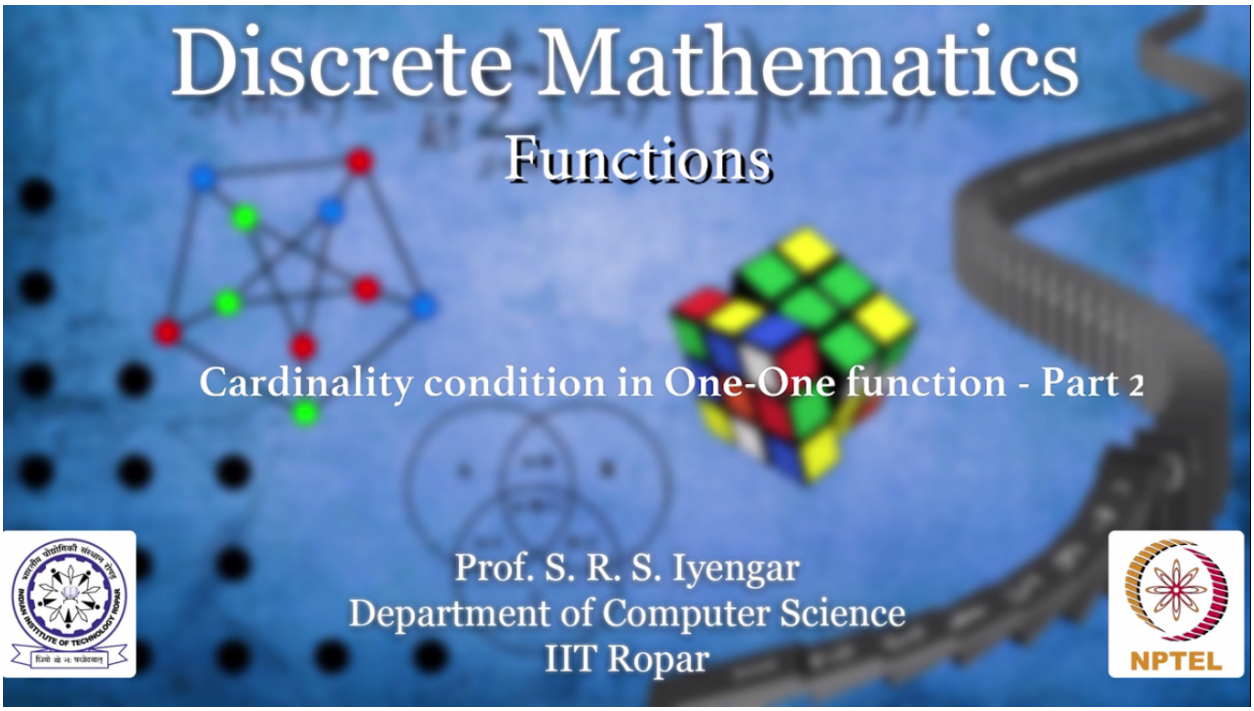
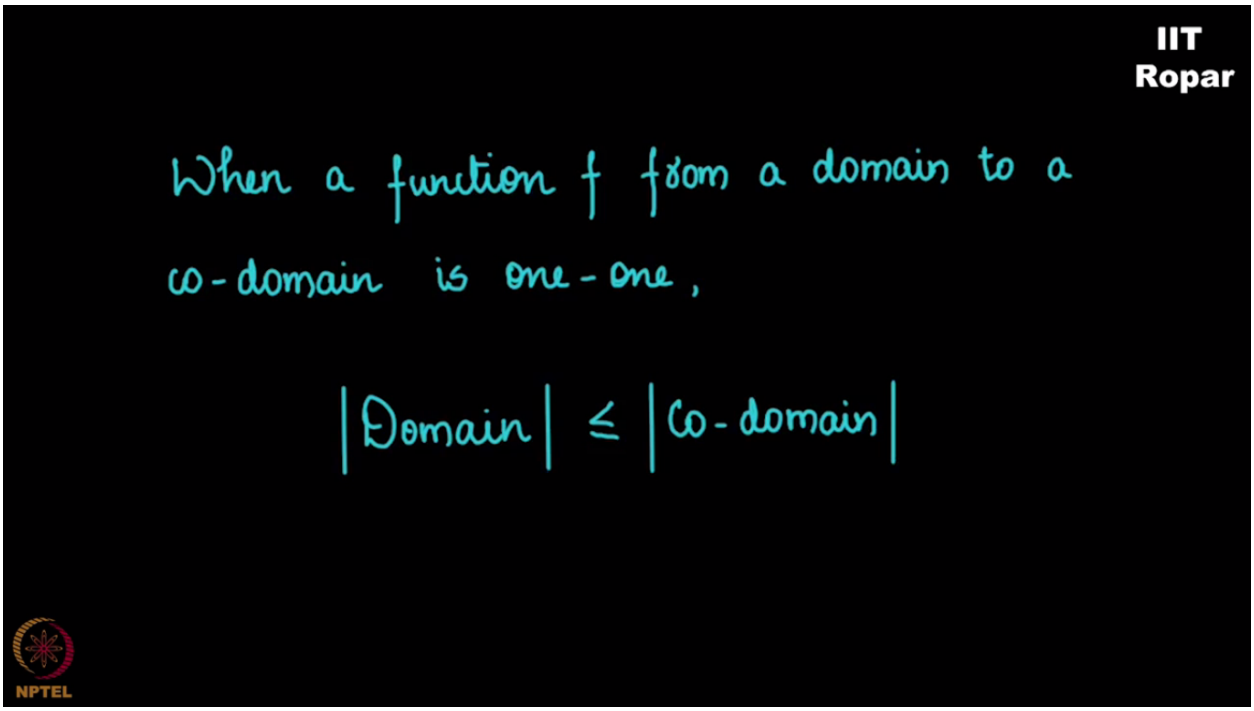


Now I will tell you a small instance and you tell me what you can infer. There is this organization where every male in the organization is married and his wife also works in the same organization. Now remember something in mathematics. Whatever we say is all that we say. Whatever we don't say should not be assumed. For example I said every male in the office is married by that I don't mean that every female in the office is married. I am not saying that. If you see a male you must know that that male is married. Not only that, that person's wife is also in the same office. Then what can we say about the number of males and number of females in the office? Think about it.

So the number of males if I put them in a domain and call it M and number of females if I put them in set and call it F my function f will be from male M to let's not call it F let's call it W. Man to Woman. Alright. So f of an element here will simply take you to his wife. What can you say about the organization here? I can say that the number of males here is certainly less than or equal to number of women here. Why? Why because according to what I said I repeat I said every man here in this organization is both married as well as his wife works in the same organization.

This implies that no man is single. And no man's wife it doesn't so happen that she is not in the organization. A man is married and his wife is also in the same organization. Note I am not talking a thing about a woman here who may be single. I have never said anything about the woman here. Correct. So there could be a single woman. So all that you can infer is that this is one-one function because in our country in fact many countries a

person cannot be married to two people simultaneously. Correct. So a person here has a unique woman as his wife and hence the function is one-one function. When the function is one-one the co-domain may have some left overs and we can only conclude that the number of elements in M is less than or equal to number of elements in W. So what is the moral of this video clip? We are trying to say that whenever there is a function F from a domain to a co-domain which is one-one we can sure that the number of elements in the co-domain will be equal to or greater than the number of elements in the domain.



Now this is a very important fact. You may want to make a note of it. And you may want to use this in solving some questions that can come by your way.