NPTEL
NPTEL ONLINE COURSE

Discrete Mathematics
Functions

Number of Bijections

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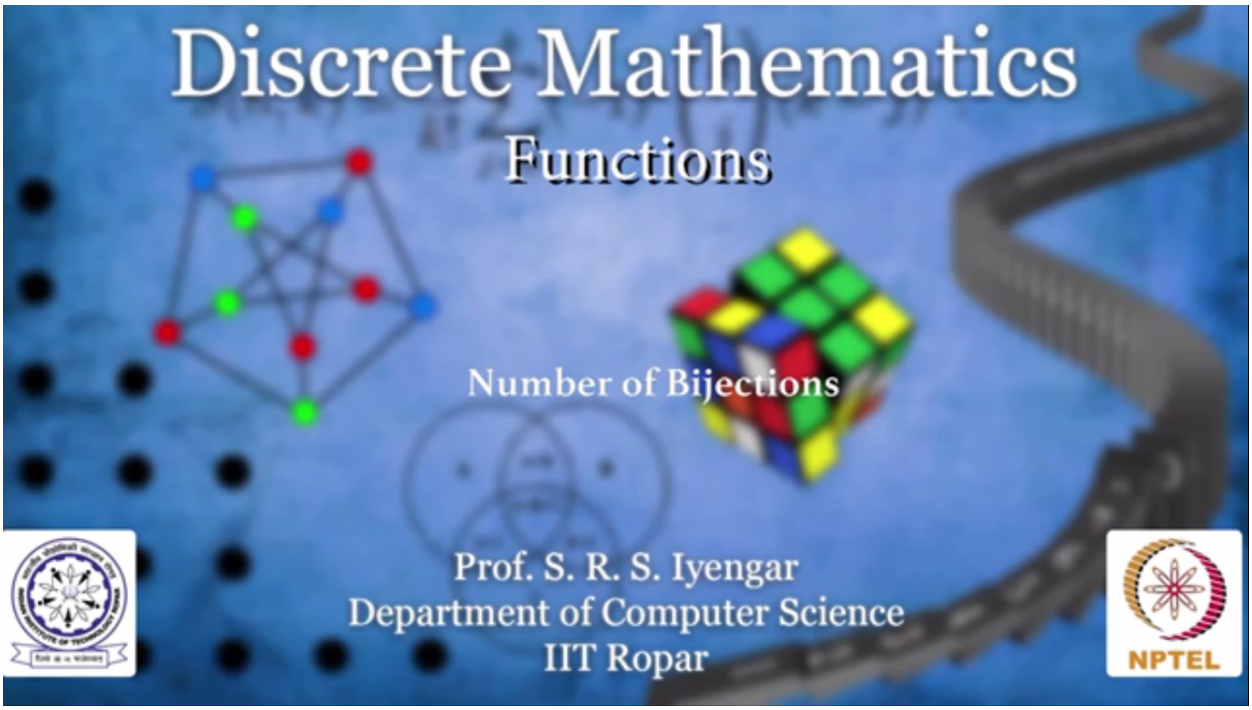
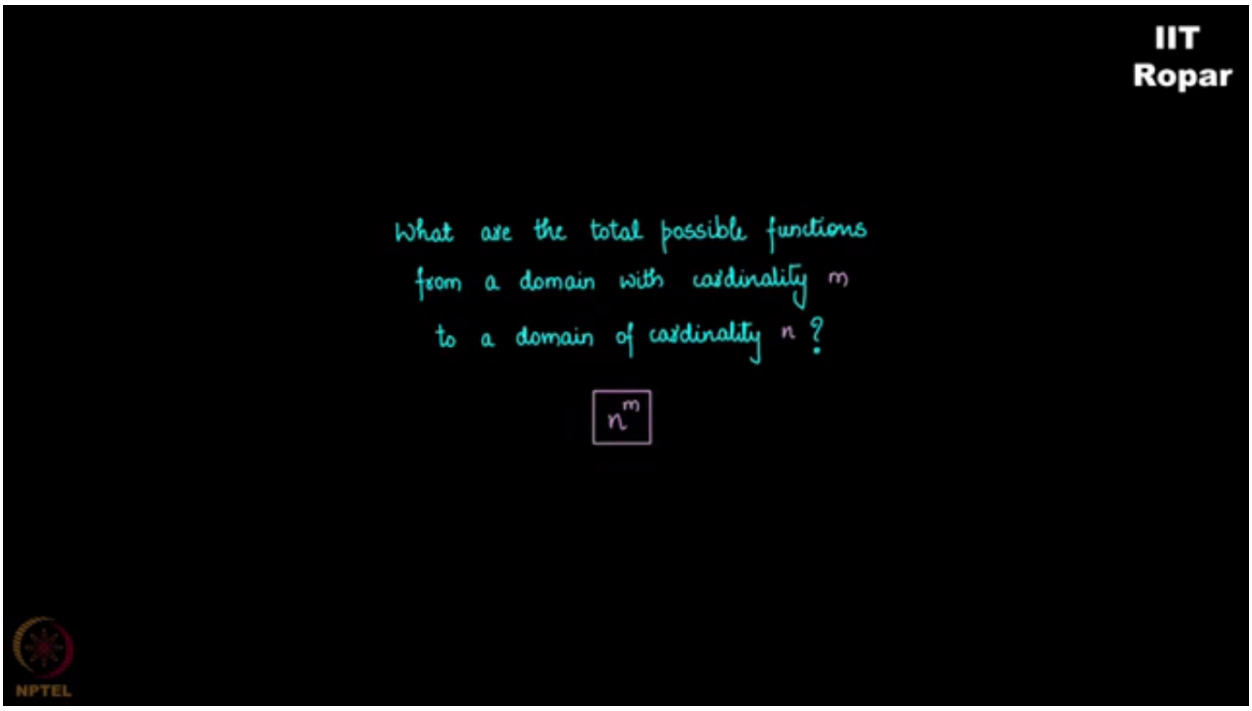
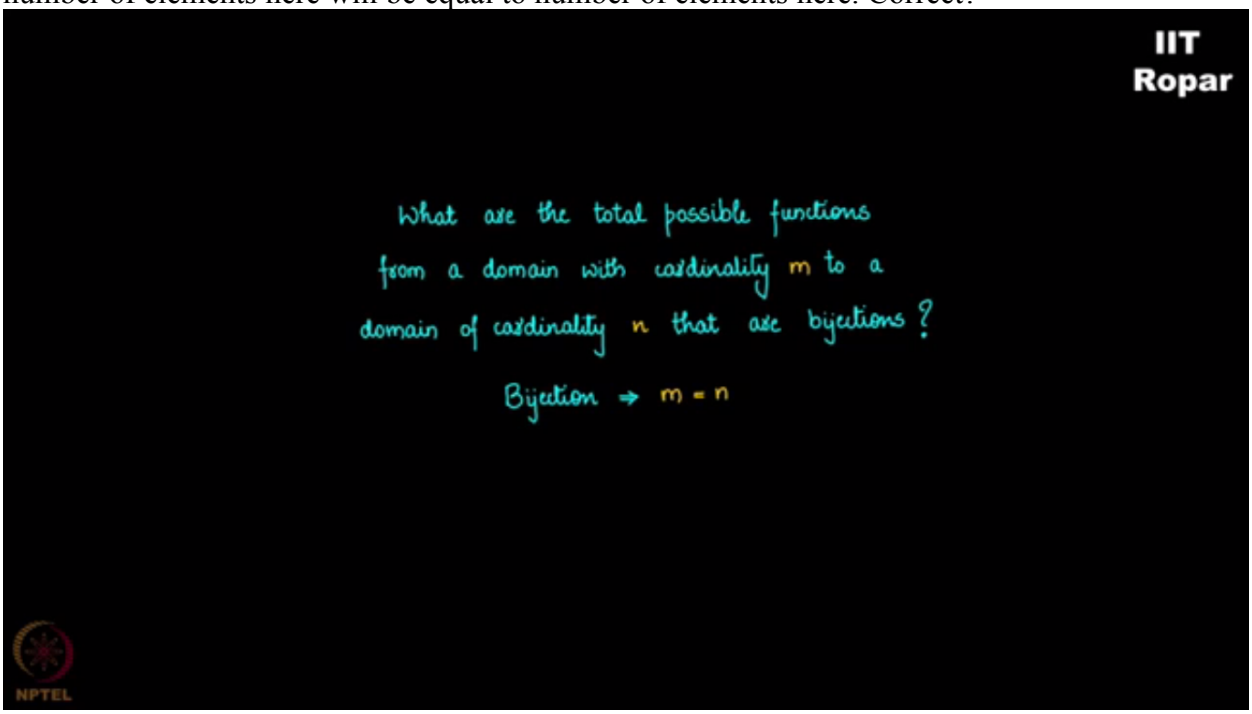


What are the total possible functions from a domain of cardinality m to a domain of cardinality n? We have seen this, right? It was n to the m.

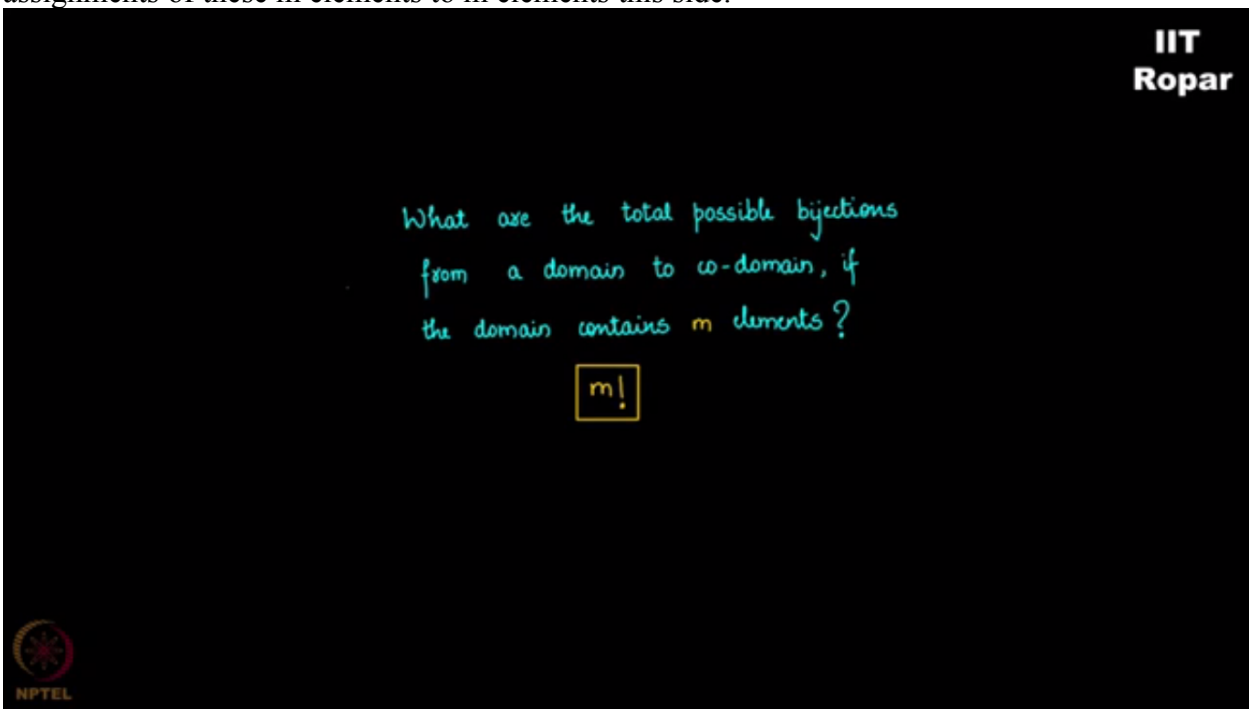


Now my question is what are the total number of functions from a domain with cardinality m to a co-domain with cardinality n that are bijections? Now the question itself doesn't make sense you see because I just now told you that whenever there is a bijection, m becomes equal to n. The number of elements here will be equal to number of elements here. Correct?



So what is that number? What are the total possible bijections from a domain to co-domain? If the domain contains let's say m elements, it's going to m! and why is that? We saw that the total possible one – one functions from a domain to a co-domain, you remember the formula. We used

permutations there. So even without that we can say how it's m!. It is basically all possible assignments of these m elements to m elements this side.



Think about it. I am just giving you the answer. It is straightforward. It follows from the theory that we discussed for one – one functions.

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