NPTEL

NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Set Theory

Cardinality of Union of two sets – Part 2

With
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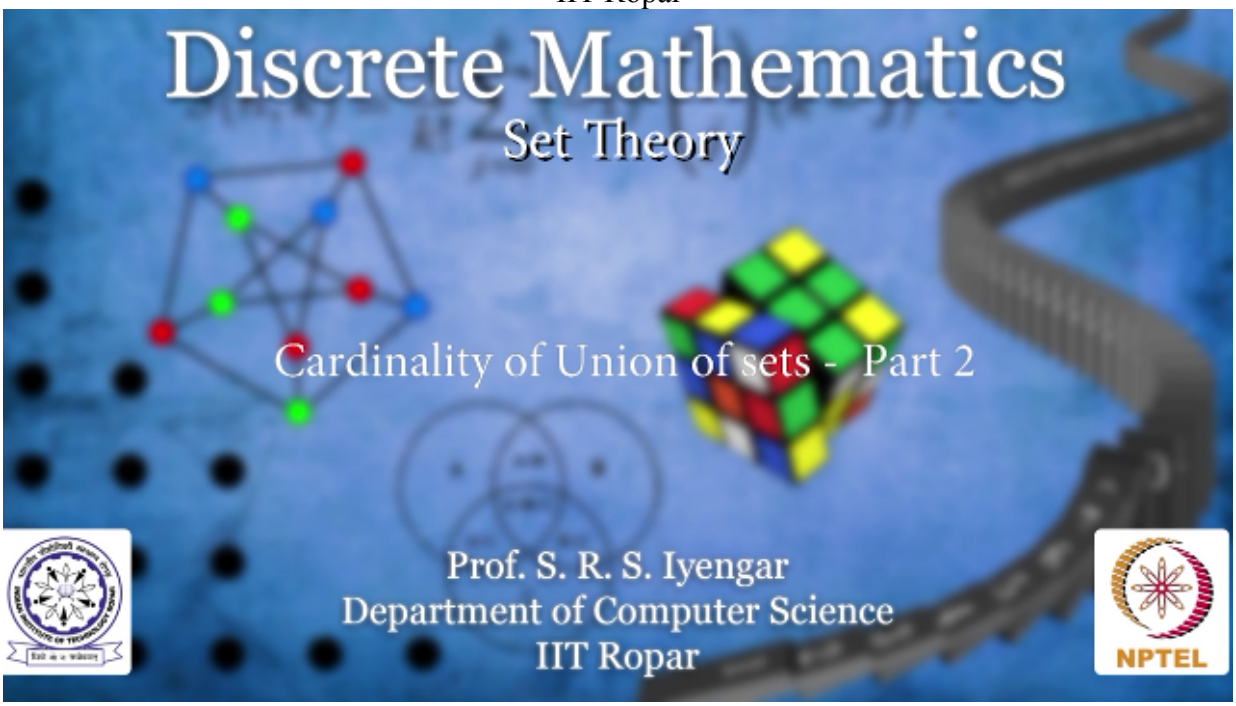
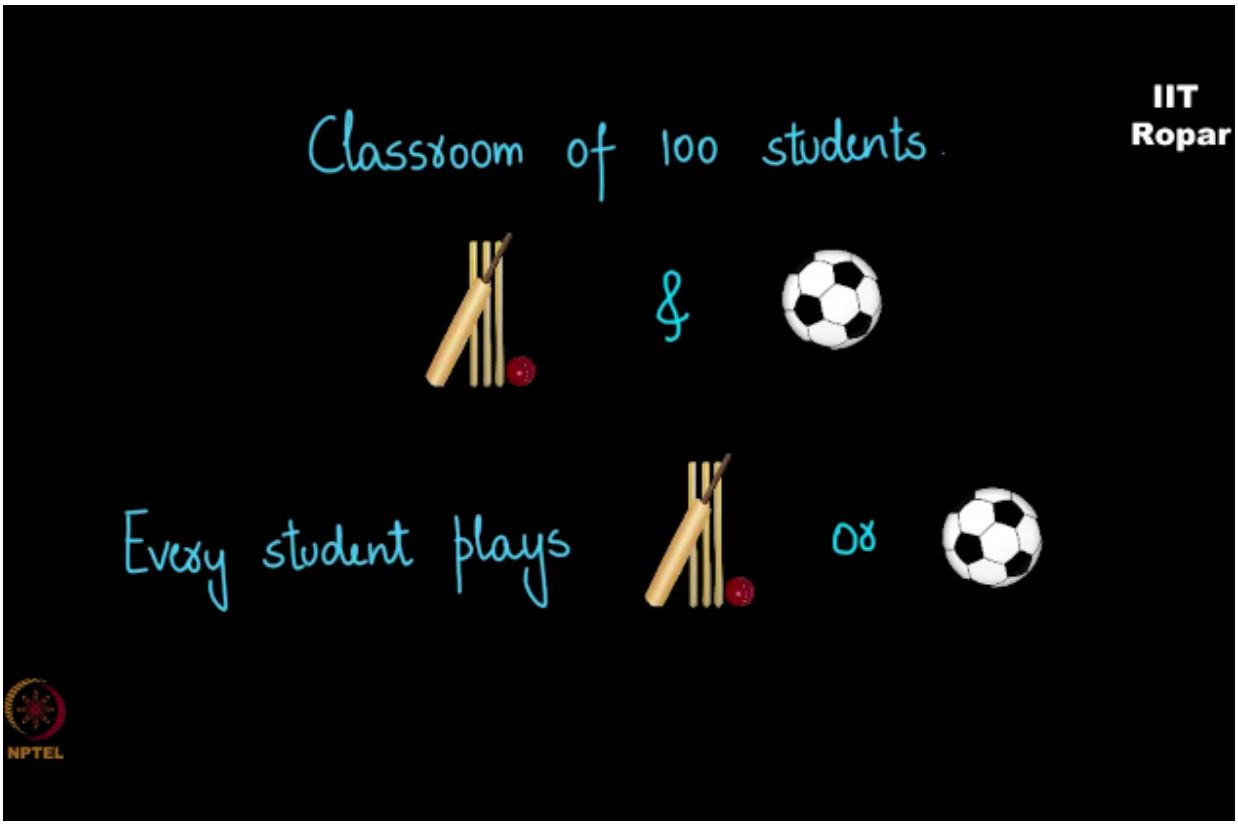
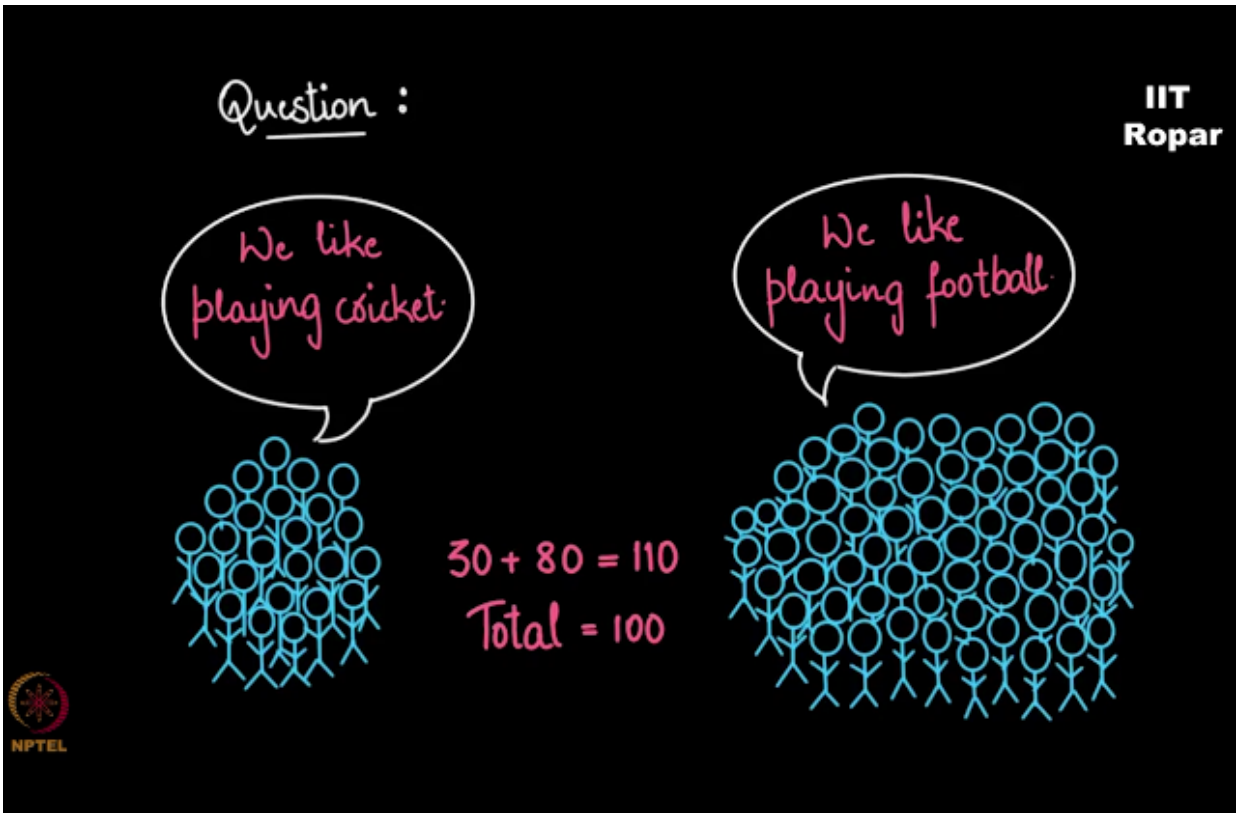


Here is a good application of what we just learnt, consider a set of people in a classroom of 100 students, these students play cricket and football, so every student is supposed to play cricket or football. Of course he's encourage to play both if he wants but not many like playing both, but they enjoy playing at least one of these games.

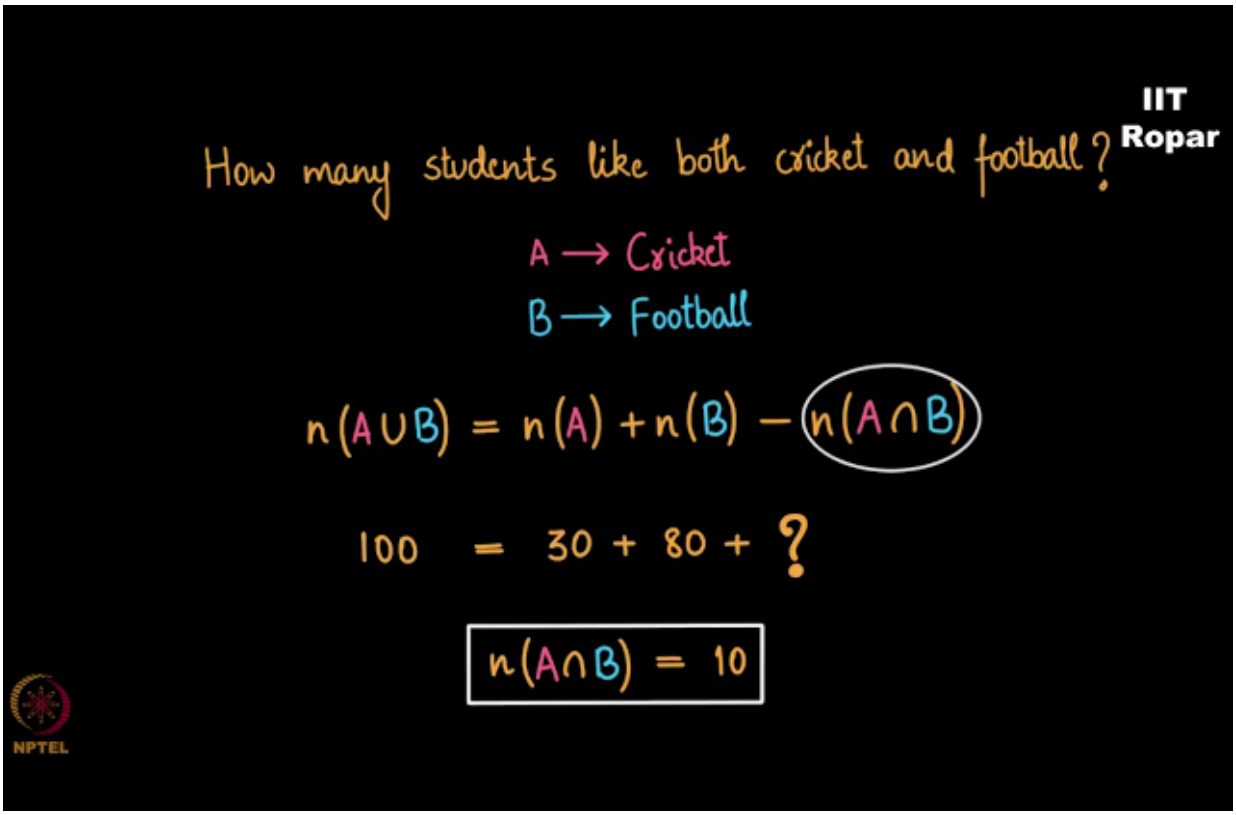


So here is the question, there are 30 people who say they like playing cricket, they never say they don't like football, they only say they like playing cricket, and 80 people say they like playing football.

Okay, now the question is given 100 students if 30 say they like cricket, 80 say they like football, 30 + 80 is turning out to be 110, but the number of students is 100.



Our question is how many students like both cricket and football, that's the question. The answer is the simple application of the formula that we discussed, number of elements in A union B is number of elements in A, let's say A stands for cricket, B stands for football, plus number of elements in B – number of elements in A intersection B, so number of elements in A union B is given, there are 100 students, number of elements in A is also given 30 like playing cricket, number of elements in B is 80, so what is this number here? And little bit of calculation tells you that this number is supposed to be 10 which is in the intersection of A and B.



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