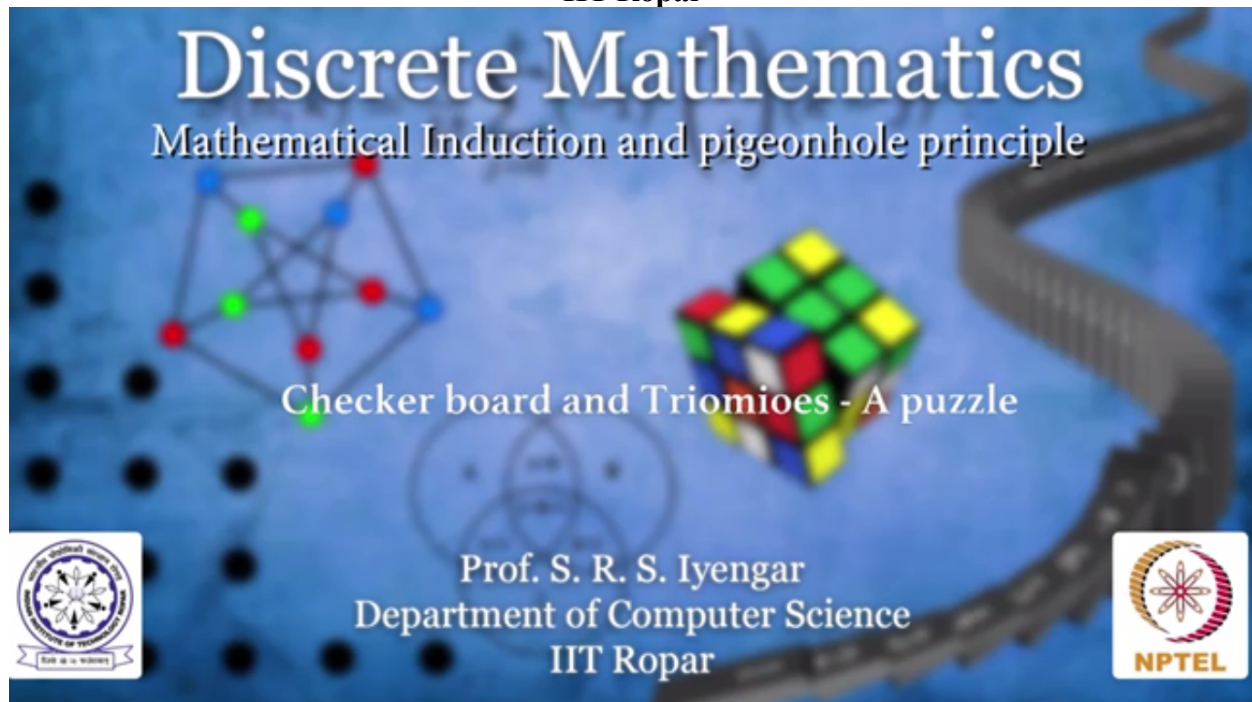


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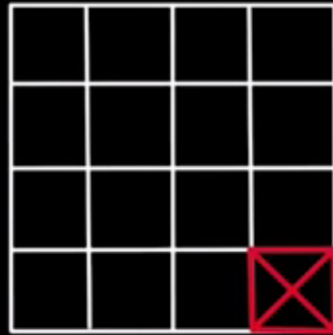
**Discrete Mathematics
Mathematical Induction and pigeonhole principle**

Checker board and Triominoes - A puzzle

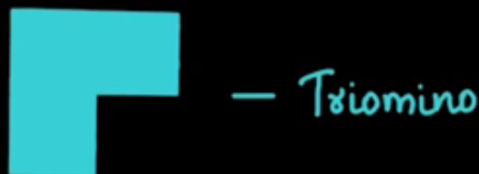
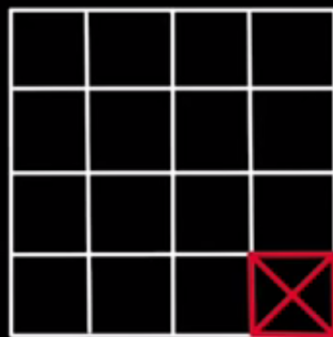
**Prof. S. R. S. Iyengar
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Here is a nice puzzle for all of you to solve. I give you a checkerboard like this. It is a 4×4 checkerboard and what I do is I remove one square in this checkerboard. Okay. Assume I remove this square.



Now the question is you have to tile this one square removed checkerboard using a triomino. Now this is a Triomino. So how are you going to do it? You have to place such tiles on this entire checkerboard such that the checkerboard is covered. Okay. I have removed this square and the rest of it should be using these tiles.

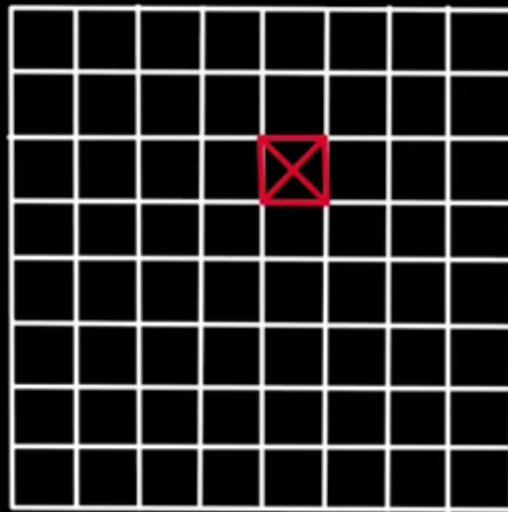


So take some time and solve it. So it's going to look like this.



So these are the triominoes used. You see I am able to tile it completely using these triominoes.

Now a more challenging question for all of you would be to do the same process that is see if you can tile this 8 x 8 chequerboard with one square removed using such triominoes.



If you're interested, you should also be able to solve the further problem, that is can this $2^n \times 2^n$ checkerboard be tiled where one square is not there using triominoes?

Can a $2^n \times 2^n$ checkerboard be tiled
using triomino (one-square removed)?



It's a challenge for you all. See if you can do it.

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