

## Mathematics of Computer Science. - M.I.T. opencourseware

### Abstract:

axioms could be true or false, but there's a theorem(important proposition) that we have to find out it is true or false . so we need patterns of proof

### For the English:

new terms I learned = theorems, preliminary, lemma, corollary, denote, connote, potential pitfall, filler words, cardinality

expression =  $a$  over  $b$  / 2 th the  $n$  / fraction in lowest terms /  $(2 \mid a)$  means  $a$  is even

## Lec 2. PROOFS & INDUCTION:

$\sqrt{2}$  is irrational

1. proof by contradiction

converse, inverse, contrapositive = 역 이 대우

2. false proof => false triangle of gold

3. proof by induction

what is inductive hypothesis?

let  $P(n)$  is predicate

if  $P(0)$  is true &&  $P(n) \Rightarrow P(n+1)$  is true // for all  $P(n)$  is true in positive integer  $n$   
= base case / 2<sup>nd</sup> case / common case

$$- 1+2+3+\dots+n = n(n+1)/2$$

$$- 3 \mid n^3 - n$$

- 0 is multiple of all number

- all horses are the same color

-  $P(1) \Rightarrow P(2)$  is missing in set length(cardinality)

- proof Frank Gehry tiles of L shape, there a Bill who wants to stay in middle