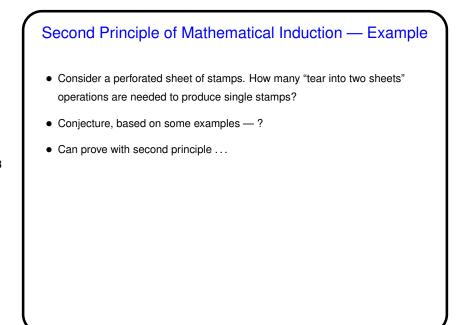


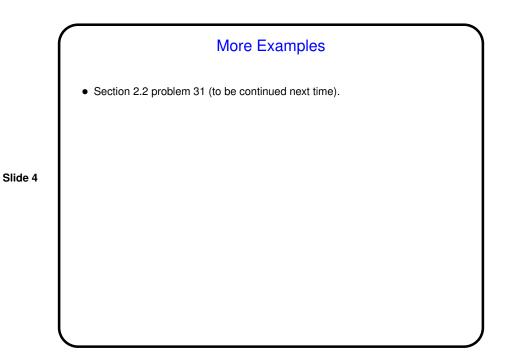
Mathematical Induction, Recap
Basic idea is to prove something true for all integers greater than some base value (usually 0 or 1) in two steps:

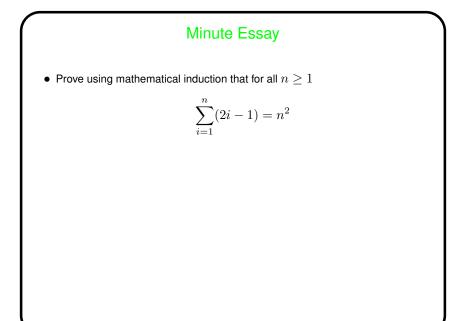
Base case — prove directly for smallest value.
Inductive step — prove that if true for k (first principle), or all numbers from base case through k (second principle), then also true for k + 1.

Slide 2



Slide 3





Slide 5

Slide 6

| Minute Essay Answer |
|---|
| |
| • Base case: $n = 1$. $n^2 = 1$ and n |
| $\sum_{i=1} (2i-1) = 1$ |
| Inductive step: Assume |
| $\sum_{i=1}^{k} (2i-1) = k^2$ |
| and show $k{+}1$ |
| $\sum_{i=1}^{k+1} (2i-1) = (k+1)^2$ |
| Using inductive hypothesis: |
| $\sum_{i=1}^{k+1} (2i-1) = \sum_{i=1}^{k} (2i-1) + 2(k+1) - 1 = k^2 + 2k + 1 = (k+1)^2$ |