

Mathematical Induction

* Induction

- show base is True, then induction

ex - $P(k) = 1+2+\dots+n = \frac{n(n+1)}{2}$

$P(5) = \text{true}$

- $P(1) = \text{true}$ basis

- assume $P(k)$ is true, show $P(k+1)$ is true

- when $n=1$, $1 = \frac{1(1+1)}{2}$ is true, i.e. the basis step

- $P(k): 1+2+3+\dots+k = \frac{k(k+1)}{2}$

- $P(k): 1+2+\dots+k+1 = \frac{k+1(k+1+1)}{2}$

* Steps

- show true for the basis, usually $P(1)$

- then show $P(k) \rightarrow P(k+1)$ is true