Discrete Structures

- Premises, Conclusions, Arguments

- **Theorem:** is a statement that can be shown to be true.
- **Proof:** valid Argument that establishes the truth of a theorem

1. Direct Proof
2. Proof of contraposection
3. Proof of contradiction

- Thursday Quiz
  → Application of propositional logic
  → Rules of Inference

- Assignment
  → 19-9-24

Direct Proof

Q- If n is an odd integer, then n^2 is odd

- $P(n)$ → n is an odd integer
  $Q(n)$ → n^2 is an odd integer

$\forall n\,(P(n) \rightarrow Q(n))$; m be any odd integer

$m = 2k+1$

$m^2 = (2k+1)^2$

$m^2 = 4k^2 + 4k + 1$

Contraposition Proof

- If q is false, then p is false