Lecture 15.

e.g. For any integer $n$, iff $6|n$ iff $2|n \wedge 3|n$.

Proof: Let $n$ be an arbitrary integer. Assuming $6|n$. So there exist an integer $k$ such that $n=6k = 2(3k) = 3(2k)$.

e.g. Suppose $A \cap (B \setminus C) = (A \cap B) \setminus C$

Given Goal

For $x \in A \cap (B \setminus C) \leftrightarrow x \in (A \cap B) \setminus C$

$\Rightarrow$ Goal 1 : $\rightarrow$ Goal 2 : $\leftarrow$.

For goal 1 : $x \in A \cap (x \in B \wedge x \notin C)$ goal 2 : $(x \in A \wedge x \in B) \wedge x \notin C$.

Proof : Let $x$ be arbitrary, Then

$x \in A \cap (B \setminus C)$ iff $x \in A \cap (x \in B \wedge x \notin C)$ iff $(x \in A \wedge x \in B) \wedge x \notin C$

iff $x \in (A \cap B) \setminus C$

Since $x$ is arbitrary, --------

## §3.5. Proofs involving $\vee$

To use a given of form $P \vee Q$, break the proof in two cases : 1) $P$ to the given 2) $Q$ to the given.

Template:

case 1: Assume $P$ - Proof -

case 2: Assume $Q$ - Proof -

- We know $P \vee Q$, these cases are exaustive. therefore, the goal is true.

$x^2/4 = ky$ / $k = 2t+1$.