## 7.4 Biconditionals and Good Definitions

Implications

If P then Q

Converse

If Q then P

## Biconditional

(Two conditions)

if than to if and only if (iff)

Implication
If it is sunny then I open the window

Converse
If I open the window then it is sunny

Biconditional
It is sunny iff I open the window

P

The sum of two integers is even iff the two integers are even

Q

F If the sum of two integers is even then the two integers are even

T If the two integer are even then the sum of the integers is ever

In order for a biconditional statement to be true

Both the implication and its converse must be true

If both are not true then the statement is false

T An angle is a right angle Iff it measures 90°

T If the angle is a right angle then it measures 90°

T If the angle measures 90° then it is a right angle

True Biconditionals are used as good definitions in Math.

They are given and accepted as true

## Valid Arguments in Biconditionals

$P \leftrightarrow Q$
$Q$
$\therefore P$

$P \leftrightarrow Q$
not $P$
$\therefore$ not $Q$