If, only if, if \& only if

ex. The number 4 is even if and only if 4 is divisible by 2.

"equal statements"

\[ E \iff D \]

4 is even if 4 is divisible by 2, and 4 is even only if 4 is divisible by 2

Then

\[ D \implies E \quad \text{and} \quad E \implies D \]

\[
\begin{array}{c|c|c|c}
E & D & E \implies D & D \implies E \\
T & T & T & T \\
F & T & T & T \\
\end{array}
\]

\[ \neg E \implies \neg D \]

\[ (E \iff D) \land (D \iff E) \]