

- If we want to prove $P \iff Q$, then we usually break it up into two pieces:

- 1 Do $P \implies Q$;
- 2 Then do $Q \implies P$.

(positive plus converse)

- But we can also:

- 1 Do $P \implies Q$;
- 2 Then do $\neg P \implies \neg Q$.

(positive plus inverse)

- Note that the inverse and the converse are the same, since they are contrapositives of each other!!

Said another way:

$$(P \iff Q) \iff (P \implies Q) \wedge (Q \implies P),$$
$$(P \iff Q) \iff (P \implies Q) \wedge (\neg P \implies \neg Q),$$