



"if P is true, then Q is true"

"if Q is false, then P is false"



"if P is true, then Q is true"

"if P is false, then Q is true"

indirect proofs

indirect proofs

- Proof by contrapositive

to prove the statement

"if P is true, then Q is true"

you instead prove the equivalent statement

"if Q is false, then P is false"

- Proof by contradiction

to prove the statement

"if P is true, then Q is true"

and show that the following is not possible

"if P is false, then Q is true"

- Proof by counterexample (not technically a proof)

indirect proofs: proof by contrapositive

Theorem

For any $n \in \mathbb{Z}$, if n^2 is even, then n is even.

