Disproof by Counterexample

Requirements

- State false.
- Give a counterexample.
- Explain why your counterexample is a counterexample.

Example

Prove or disprove: All prime numbers are odd.

Proof. This statement is false.

Counterexample: \( n = 2 \). \( 2 = 2 \cdot 1 \) so \( n \) is even. 2 and 1 are the only factors of 2 so it is prime. We have found an even prime number so the original statement is not true. □