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.

Solution:

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.