



on first proof (by contradiction)

even

odd

For all

if

then





# our first proof (by construction)

## Theorem

For all integers  $n$ , if  $n$  is even, then  $n^2$  is even.



- Find the **formal definitions** for any terms in the theorem:
  - an integer  $n$  is called **even** if there is an integer  $k$  where  $n = 2k$
  - an integer  $n$  is called **odd** if there is an integer  $k$  where  $n = 2k + 1$
- What is the grammatical structure of the theorem?
  - **For all** integers  $n$ , **if**  $n$  is even, **then**  $n^2$  is even.

# our first proof (by construction)

## Theorem

For all integers  $n$ , if  $n$  is even, then  $n^2$  is even.

