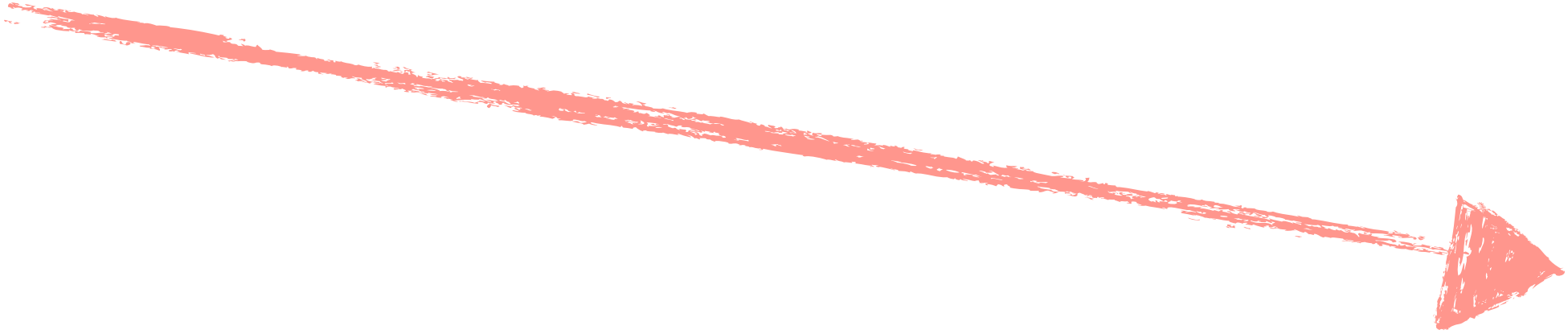
Proof.

end of proof



# our first proof (by construction)


PROVE IT

"drop the mic"

# our first proof (by construction)

**Theorem**

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


**Proof.**

- Pick an arbitrary even integer $n$: we want to show that $n^2$ is even
- Since $n$ is even, there is some integer such that $n = 2k$
- This means that $n^2 = (2k)^2 = 4k^2 = 2(2k^2)$
- From this we see that there is an integer $m$ (namely $2k^2$) where $n^2 = 2m$
- Therefore $n^2$ is even, which is what we wanted to show. ■

end of proof

"drop the mic"

# let's try another

**Theorem**

For all integers $m$ and $n$, if $m$ and $n$ are odd, then $m+n$ is even.