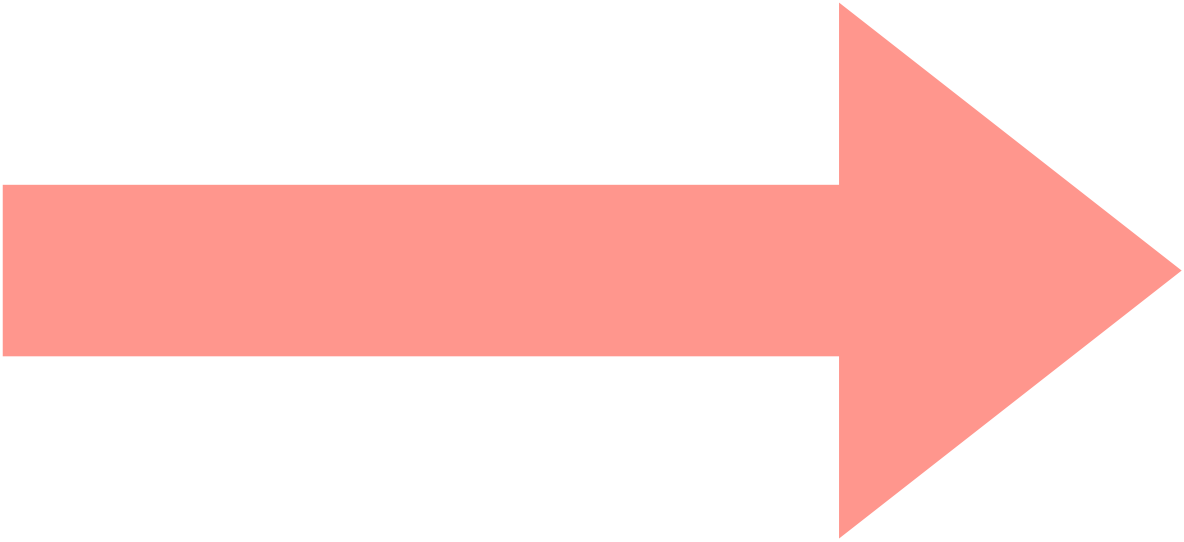
proof by induction


PROVE IT

Proof.



proof by induction

Theorem

The sum of the first n powers of two is $2^n - 1$.

Proof.

- Let $P(n)$ be the statement "the sum of the first n powers of two is $2^n - 1$."
- We prove by induction, that $P(n)$ is true for all $n \in \mathbb{N}$ from which the theorem follows
- The base case:
  - we need to show $P(0)$ is true, meaning that the sum of the first zero powers of two is $P^0 - 1$.
  - since the sum of the first zero powers of two is zero and $2^0 - 1 = 0$, we see that $P(0)$ is true. ✓

proof by induction

Theorem

The sum of the first n powers of two is $2^n - 1$.

Proof cont'd.