

## 2.1 Conjectures

### Inductive Reasoning

process of reasoning that a statement is true because specific cases are true.

| Ex: Find the next item in the pattern:

1, 1, 2, 3, 5, 8, 13, 21, 34

△, ▷, ▽, ◁

January, March, May, July

Conjecture: statements you believe to be true by inductive reasoning

Finish the conjecture:

the product of 2 odd numbers

is odd.

$$1 \cdot 5 = 5$$

$$3 \cdot 7 = 21$$

$$5 \cdot 9 = 45$$

The number of dots it takes to form an  $n$ -sided square is  $n^2$ .



To prove a conjecture is true you need a proof. To show it is untrue, all you need to show is one case is false.

This case is called a counterexample

Determine if the conjecture is true.  
If not, find a counter example.

There are 4 people in this room  
whose names start with A.

False, there none

For all positive numbers  $n$ ,

$$\frac{1}{n} \leq n \quad \frac{1}{1} \leq 1 \quad \frac{1}{2} \leq 1 \quad \frac{1}{3} \leq 1$$

True

## Inductive Reasoning

1. look for pattern
2. make a conjecture
3. prove the conjecture, or show a counterexample