

## 1.5 Inductive Reasoning

Observations made  
based on patterns  
that are repeated

2, 4, 6, 8, 10

## Patterns

1, 4, 9, 16, 25, 36  
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$   
 3 5 7 9

adding consecutive odds

$1^2, 2^2, 3^2, 4^2, 5^2, 6^2$

1, 1, 2, 3, 5, 8, 13, 21  
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$

## Patterns

11 121 1331 14641

Our guess as to what  
happens next is called  
a conjecture

Statements are always true  
unless there is 1 reason that  
it is false

$$x^2 > x$$

Is  $1^2 > 1$  No

This is a counterexample

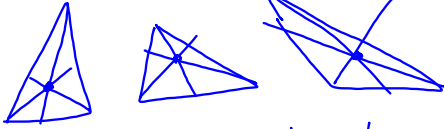
If  $x^2 = 25$ , then  $x = 5$

$$-5 \cdot -5 = 25$$

false

If  $x = 5$ , then  $x^2 = 25$   
True

bisectors of a triangle  
bisect each angle



Angle bisectors intersect  
at the same point

$$a^2, b^2, c^2$$



$$a^2 + b^2 = c^2$$

$$6^2 + 8^2 = 10^2$$

$$36 + 64 = 100$$

$$100 = 100$$

right triangle