Geometry

2.1 Use Inductive Reasoning

# Conjecture and Inductive Reasoning

Conjecture

observation

Unproven

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ statement based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Inductive Reasoning

specific

pattern

* First find a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cases

general

conjecture

* Second write a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ case

Sketch the fourth figure in the pattern

Describe the pattern in the numbers 1000, 500, 250, 125, … and write the next three numbers in the pattern

Each number is ½ the previous number: 62.5, 31.25, 15.625

Given the pattern of triangles below, make a conjecture about the number of segments in a similar diagram with 5 triangles

Each figure has two more segments

Third figure has seven segment, so 5th has 7 + 2 + 2 = 11

Make and test a conjecture about the product of any two odd numbers

Product means multiply

Try several: 3(5) = 15; 7(11) = 77; 9(3) = 27

Looks like the product of two odd numbers is odd

# Proving by Inductive Reasoning

Show all cases

The only way to show that a conjecture is true is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

One case

To show a conjecture is false is to show \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where it is false

counterexample

* This case is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Find a counterexample to show that the following conjecture is false

The value of x2 is always greater than the value of x

Sample answer: let x = ½; x2 = ¼

Assignment: 75 #5, 6-18 even, 22-28 even, 32, 34, 38-46 even, 47-49 all = 22 total