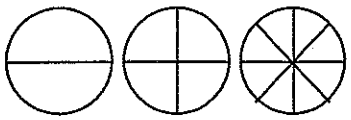
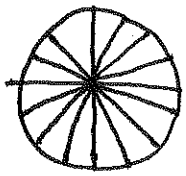
Geometry
Notes 1-1 Patterns and Inductive Reasoning

Name KEY
Date_____ Period____

Inductive Reasoning: What is the next pattern?  What are the next two terms? 3, 6, 12, 24, •2 •2 •2	Inductive reasoning is reasoning that is based on patterns you observe. If you observe a pattern in a sequence you can use inductive reasoning to tell what the next term in the sequence will be. Draw the next pattern in the sequence:  Write the next two terms in the sequence: 48, 96
A Conjecture Example: Make a conjecture about the sum of the first 30 odd numbers.	Is a conclusion you reach using inductive reasoning (reasoning based on a pattern you observe.) $1 = 1 = 1^2$ 1 $1+3 = 4 = 2^2$ 2 $1+3+5 = 9 = 3^2$ 3 $1+3+5+7 = 16 = 4^2$ 4 $1+3+5+7+9 = 25 = 5^2$ 5 Using inductive reasoning you can conclude that the sum of the first 30 odd numbers is 30^2, or 900.
A Counter Example	Not all conjectures turn out to be true. You can prove a conjecture false by finding one counter example. A counter example to a conjecture is an example for which the conjecture is incorrect.

Finding Counter Examples	Conjecture: The square of any number is greater than the original number. Counter Example: $1^2 \not> 1$ Conjecture: Any three points can be connected to form a triangle. Counter Example: If the three points are collinear they will not form a triangle.

$1^2 = 1$
$2^2 = 4$
$3^2 = 9$
$4^2 = 16$
$5^2 = 25$
$6^2 = 36$
$7^2 = 49$

You Try!

Find the next two terms:

1. 5, 10, 20, 40, 80, 160

2. 1, -1, 2, -2, 3, -3, 4

3. 

4. Develop an algebraic expression which can be used to find how many square units will be in the *n* th figure if the pattern continues.

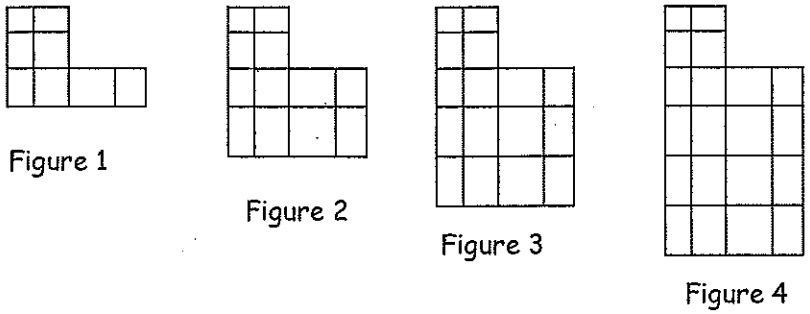


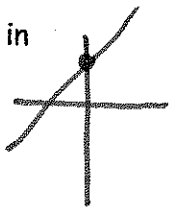
Figure 1 Figure 2 Figure 3 Figure 4

$n = 1$ $n = 2$ $n = 3$ $n = 4$

# of square units: 8, 12, 16, 20

algebraic expression is $4n + 4$

$y = mx + b$
$y = 4x + 4$



X	Y
1	8
2	12
3	16
4	20

STAT
EDIT
- entered values
2nd Quit
STAT → CALC
4. LinReg