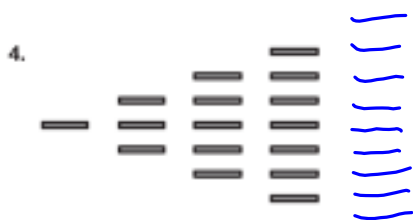
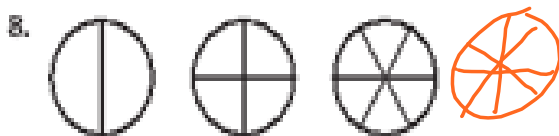
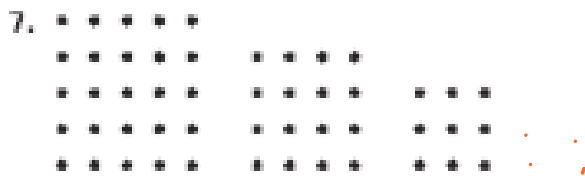
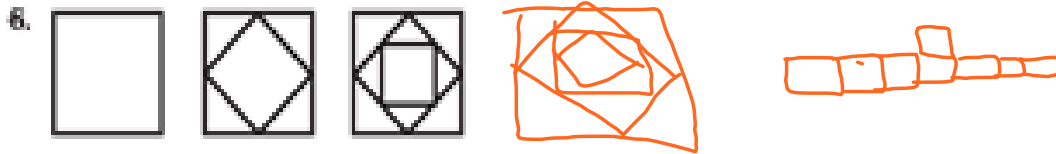
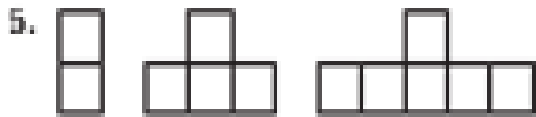


2.1
USE
INDUCTIVE
REASONING

Sketch the figure you expect to see next in the pattern.





Describe in words the pattern of the numbers below & predict the next number.

9. 2, 6, 10, 14... 18
add 4

10. 14, 11, 8, 5... 2
minus 3

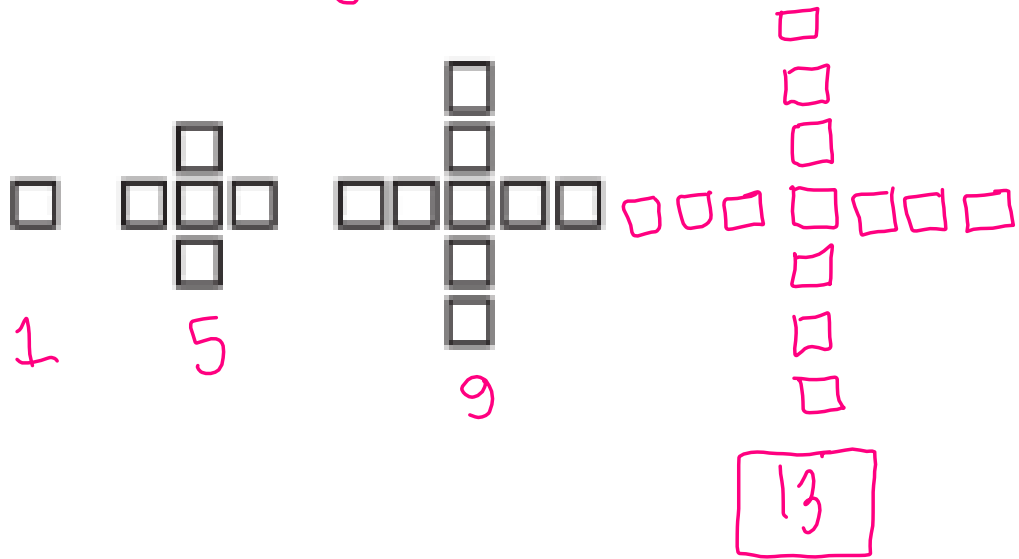
11. 1, 5, 25, 125,... 625
times 5

12. 20, 19, 17, 14,... 10
-1 -2 -3

13. 24, 12, 6, 3,...
divide by 2
times 1/2
consecutive integers
3/2 or 1.5

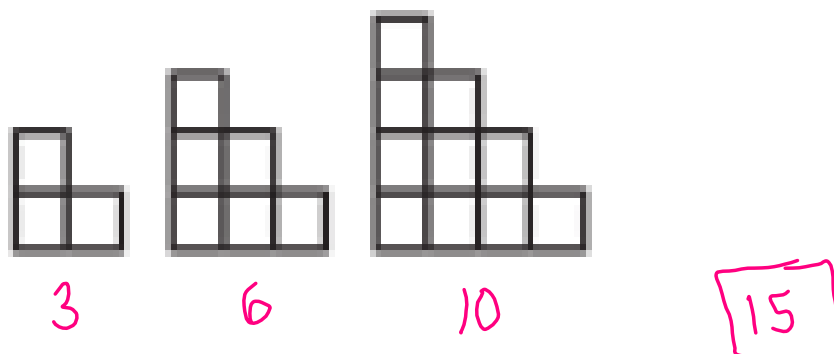
The first three objects in a pattern are shown.
How many square are in the next object?

14.



The first three objects in a pattern are shown.
How many square are in the next object?

15.



Reasoning in geometry consists of three stages:

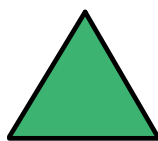
1. Look for a Pattern
2. Make a Conjecture
3. Verify the Conjecture

conjecture - an unproven statement that is based on patterns or observations

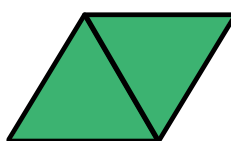


Given the pattern of triangles below, make a conjecture about the number of segments in a similar diagram with 5 triangles.

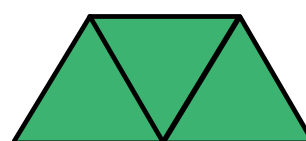
16.



3



5



7

4 Δ 's

9

5 Δ 's

11 segments

17. Make and test a conjecture about the sum of any three consecutive integers.

The sum of any three consecutive integers is a multiple of three.

$$1 + 2 + 3 = \underline{6}$$

$$2 + 3 + 4 = \underline{9}$$

$$3 + 4 + 5 = \underline{12}$$

$$12 + 13 + 14 = \underline{39}$$

inductive reasoning the process of looking for patterns and making conjectures

counterexample any example that shows a conjecture is false

Example: Conjecture- All odd numbers are divisible by 3.

Just need 1!
Can you think of an odd number
that isn't divisible by 3?

13

7

11

5

29

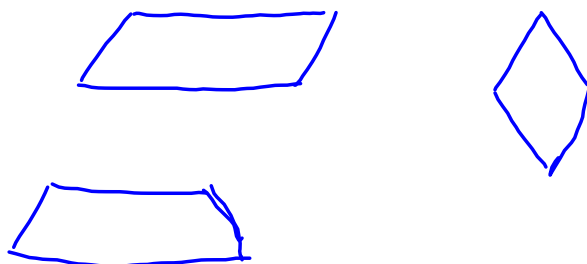
18. Find a counterexample to prove the conjecture is false.

Conjecture: The sum of two numbers is always greater than the larger of the two numbers.

$$-12 + 20 = 8$$

19. Find a counterexample to prove the conjecture is false.

Conjecture: All shapes with four sides are rectangles.



CHALLENGE

p. 67 #'s 6-22 even

Conjecture: The sum of the first n odd positive integers is n^2 .

first odd positive integer: $\longrightarrow 1 = 1^2$
sum of first two odd positive integers: $\longrightarrow 1 + 3 = 4 = 2^2$
sum of first three odd positive integers: $\longrightarrow 1 + 3 + 5 = 9 = 3^2$
sum of first four odd positive integers: $\longrightarrow 1 + 3 + 5 + 7 = 16 = 4^2$