

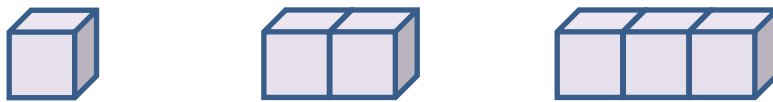
# Inductive Reasoning Assignment

Make a conjecture about the next figure in the pattern. Then draw the figure.

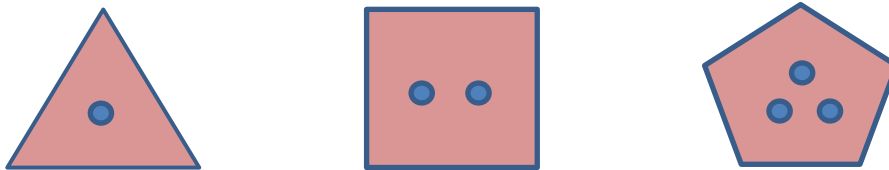
1.



2.



3.



4.



## Inductive Reasoning Assignment

Write a rule for each number pattern, and find the next number.

5. 1, 5, 9, 13 ... ..

6.  $1, \frac{2}{3}, \frac{1}{3}, 0$  ... ..

7. -5, -2, 4, 13 ... ..

8. 3, 12, 48, 192 ... ..

9. 0.45, 0.70, 0.95, 1.2 ... ..

## Inductive Reasoning Assignment

10. 1, 8, 27, 64, 125 ... ..

Find one counterexample to show that each conjecture is false.

11. The sum  $a^2 + b^2$  is equal to  $(a + b)^2$

12. All numbers that are divisible by 3 are also divisible by 6.

13. All pentagons have exactly five congruent sides.

14. All even numbers are composite.

15. The sum of two numbers is always greater than the larger number.

16. The difference of any two numbers is always smaller than the larger number.

# Inductive Reasoning Assignment

Find the  $n$ -th term

17.

$n$	1	2	3	4	5	6	7
$n - 2$							

18.

$n$	1	2	3	4	5	6	7
$3n + 2$							

19.

$n$	1	2	3	4	5	6	7
$n - 7$							

20.

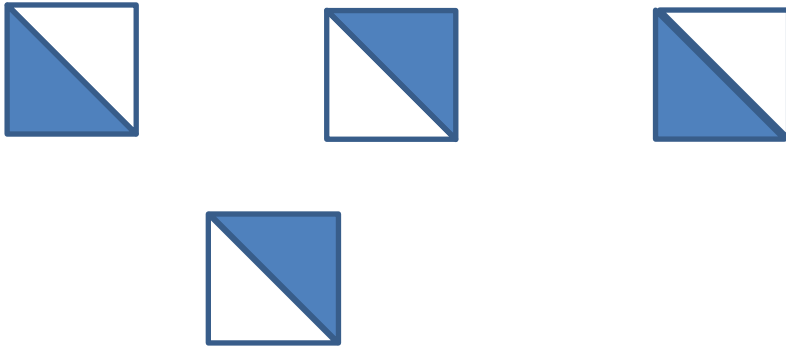
$n$	1	2	3	4	5	6	7
$2n + 4$							

# Inductive Reasoning Assignment

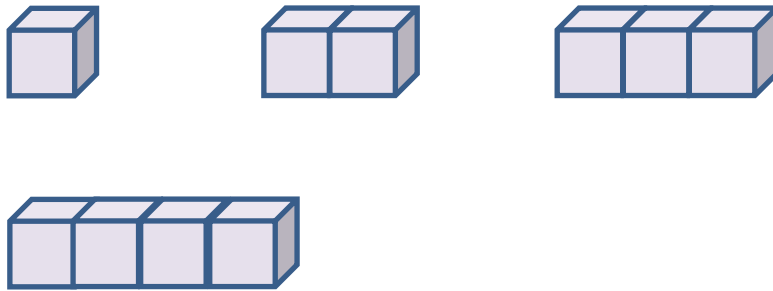
## ANSWERS

Make a conjecture about the next figure in the pattern. Then draw the figure.

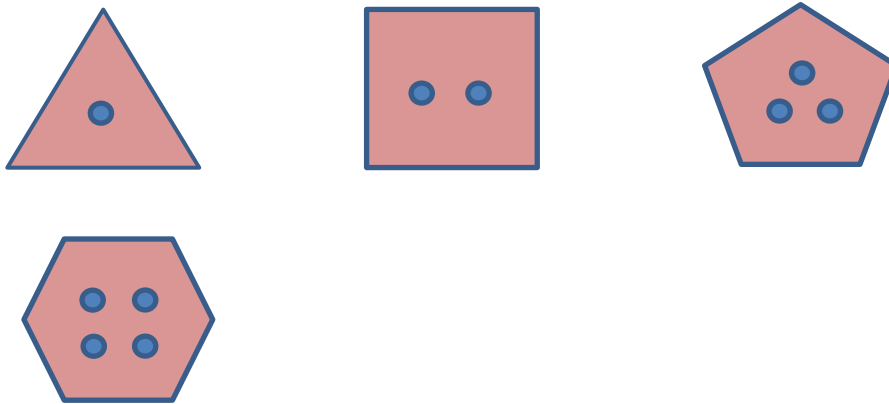
1.



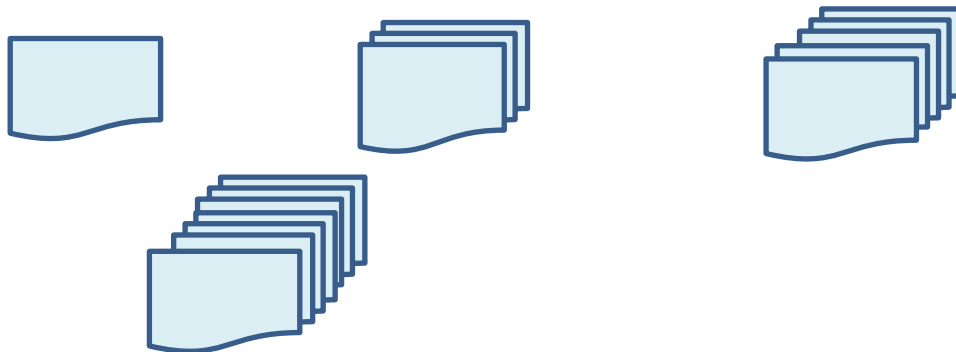
2.



3.



4.



**Inductive Reasoning** Assignment

Write a rule for each number pattern, and find the next number.

5. 1, 5, 9, 13 ... ..

Start with 1, each number is obtained by adding 4 to the previous number.

$$1 + 4 = 5$$

$$5 + 4 = 9$$

$$9 + 4 = 13$$

$$13 + 4 = 17$$

The next number is **17**

6.  $1, \frac{2}{3}, \frac{1}{3}, 0$  ... ..

Start with 1, each number is decreased by  $\frac{1}{3}$  to the previous number.

$$1 - \frac{1}{3} = \frac{2}{3}$$

$$\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$$

$$\frac{1}{3} - \frac{1}{3} = 0$$

$$0 - \frac{1}{3} = -\frac{1}{3}$$

The next number is  **$-\frac{1}{3}$** 

7. -5, -2, 4, 13 ... ..

Start with -5, each number is increased by successive multiple of 3.

$$-5 + 1 * 3 = -2$$

$$-2 + 2 * 3 = 4$$

$$4 + 3 * 3 = 13$$

$$13 + 4 * 3 = 25$$

The next number is **25**

8. 3, 12, 48, 192 ... ..

Start with 3, each number is 4 times the previous number.

$$3 * 4 = 12$$

$$12 * 4 = 48$$

$$48 * 4 = 192$$

$$192 * 4 = 768$$

The next number is **768**

9. 0.45, 0.70, 0.95, 1.2 ... ..

Start with 0.45, 0.25 is being added to each number.

$$0.45 + 0.25 = 0.70$$

$$0.70 + 0.25 = 0.95$$

$$0.95 + 0.25 = 1.2$$

$$1.2 + 0.25 = 1.45$$

The next number is **1.45**

**Inductive Reasoning** Assignment

10. 1, 8, 27, 64, 125 ... ..

Start with 0.45. Successive natural numbers are cubed.

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

The next number is **216**

Find one counterexample to show that each conjecture is false.

11. The sum  $a^2 + b^2$  is equal to  $(a + b)^2$ 

$$a^2 + b^2 = (a + b)^2$$

$$5^2 + 6^2 = 25 + 36 = 61$$

$$(5 + 6)^2 = 11^2 = 121$$

$$61 \neq 121$$

12. All numbers that are divisible by 3 are also divisible by 6.

**15 is divisible by 3 but no divisible by 6.**

13. All pentagons have exactly five congruent sides.

**An irregular pentagon doesn't have congruent sides.**

14. All even numbers are composite.

**Number 2 is even but it is a prime number.**

15. The sum of two numbers is always greater than the larger number.

$$(-23) + (-12) = -35$$

$$-35 < -12$$

16. The difference of any two numbers is always smaller than the larger number.

$$9 - (-3) =$$

$$9 + 13 = 22$$

$$9 < 22$$

# Inductive Reasoning Assignment

Find the n-th term

17.

$n$	1	2	3	4	5	6	7
$n - 2$							

$n$	1	2	3	4	5	6	7
$n - 2$	-1	0	1	2	3	4	5

18.

$n$	1	2	3	4	5	6	7
$3n + 2$							

$n$	1	2	3	4	5	6	7
$3n + 2$	5	8	11	14	17	20	23

19.

$n$	1	2	3	4	5	6	7
$n - 7$							

$n$	1	2	3	4	5	6	7
$n - 7$	-6	-5	-4	-3	-2	-1	0

20.

$n$	1	2	3	4	5	6	7
$2n + 4$							

$n$	1	2	3	4	5	6	7
$2n + 4$	6	8	10	12	14	16	18