

# Geometry WS ~~2.1-2.3~~ 2.1-2.4

1 - 3. Find the next item in the pattern.

1. 100, 81, 64, 49, 36

2. Z, Y, X, W

3. -1, 3, -9, 27, -81

4. Circle the type of reasoning you used to answer #1-3

Inductive or Deductive

5 - 12. Determine if each conjecture is true. If it is false, give a counter-example.

5. If B is the midpoint of AC, then  $AB = BC$ .

True

6. If a living thing is green, then it is a plant.

False; Lizard, Frog, etc

7. If an animal has paws, then it is a cat.

False; Dog, etc

8. If  $n \geq 0$ , then  $\frac{n}{2} > 0$ .

False;  $n=0$  (only answer)

9. If  $x$  is a prime number, then  $x + 2$  is also a prime number.

False; If  $x=7$ ,  $x+2=9$   
(Several possible answers)

10. The vertices of the image of a figure under the translation  $(x, y) \rightarrow (x+0, y+0)$  have the same coordinates as the pre-image.

True

11. If an angle is acute, then it has a measure of  $30^\circ$ .

False; Any measure between  $0^\circ-90^\circ$

12. If  $9x - 11 = 2x + 3$ , then  $x = 2$ .

$$\frac{7x}{7} = \frac{14}{7}$$

$$x = 2 \quad \text{True}$$

Identify the Hypothesis and Conclusion of each statement.

13. If it is a bicycle, then it has two wheels.

Hyp: It is a bicycle

Conc: It has two wheels

14. I will go indoors if it rains.

Hyp: It rains

Conc: I will go indoors

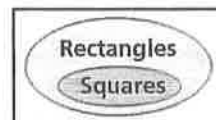
15. An angle is obtuse if its measure is  $107^\circ$ .

Hyp: An angles measure is  $107^\circ$

Conc: It is obtuse

16. Write a conditional statement

from the given diagram.



If a shape is a square,  
then it is a rectangle.

17. Given the conditional  $p \rightarrow q$ , find the following.

Converse:  $q \rightarrow p$       Inverse:  $\sim p \rightarrow \sim q$       Contrapositive:  $\sim q \rightarrow \sim p$

18. If an animal is an owl, then it is nocturnal.

Converse: If an animal is nocturnal, then it is an owl.

Inverse: If an animal is not an owl, then it's not nocturnal.

Contrapositive: If an animal is not nocturnal, then it's not an owl.

19. If a number is even, then it is divisible by 4.

Converse: If a # is divisible by 4, then it is even

Inverse: If a number is not even, then it's not divisible by 4.

Contrapositive: If a # is not divisible by 4, then it's not even.

**20 – 21 Identify whether each conclusion uses Inductive or Deductive Reasoning.**

20. At RPHS, students must pass Geometry before they can take Algebra 2. Emily is in Algebra 2, so she must have passed Geometry.

Deductive

21. Tonya studied 3 hours for each of her last two geometry tests. She got an A on both tests. She concludes that she will get an A on the next test if she studies for 3 hours.

Inductive

**22 – 24 Determine if the following are valid by Law of Detachment:**

22. If a person sees a polar bear, then they are in the arctic. James is in the arctic. Conjecture: James sees a polar bear.

Not Valid

23. If a person is 16, then they can drive a car. Johnna is 16. Conjecture: Johnna can drive a car.

Valid by Law of Detachment

24. If an American citizen is at least 18 years old, then he or she is eligible to vote. Anna is a 20-year old American citizen.

Conjecture: Anna is eligible to vote.

Valid by Law of Detachment

**Determine if the following are valid by Law of Syllogism:**

25. If a team wins 10 games, then they make the playoffs. If a team makes the playoffs, then they travel to Florida. The Ravens won 10 games. Conjecture: The Ravens will travel to Florida.

Valid by Law of Syllogism

26. If a dog eats a lot, then it will get fat. If a person always leaves food out, then a dog will eat a lot. Amy always leaves food out for her dog. Conjecture: Amy's dog will get fat.

$$\begin{array}{c} p \\ r \\ p \rightarrow q \quad r \rightarrow p \\ r \rightarrow p \quad p \rightarrow q \end{array}$$

Valid by Law of Syllogism

**27. Draw a conclusion from the given information:**

If a polygon is a triangle, then it has 3 sides. If a polygon has three sides, then it is not a quadrilateral.

Polygon P is a triangle.

Conclusion: It's not a quad.

Write a biconditional statement from the given definition or conditional.

28. A triangle is a three-sided polygon.

A polygon is a triangle iff it has 3 sides.

29. The measure of a right angle is 90 degrees.

An angle is a right angle iff it measures  $90^\circ$ .

30. If the month is January, then it is the first month of the year.

The month is January iff it is the first month of the year.

Determine if the bi-conditional statement is true. If false, provide a counter example.

31. An object is an automobile if and only if it has wheels and moves along the ground.

False  $\rightarrow$  bicycle

32. A machine is a calculator iff it performs computations with numbers.

False  $\rightarrow$  phone, computer

33. Points are coplanar iff they lie on the same plane.

T

Write the recursive and explicit equations for each sequence of numbers.

34. 10, 7, 4, 1, ...

Recursive:

$$\text{Next} = \text{Now} - 3$$

Explicit:

$$a_n = -3n + 13$$

35. -5, 5, 15, 25, ...

Recursive:

$$\text{Next} = \text{Now} + 10$$

Explicit:

$$a_n = 10n - 15$$

36. Write a rule in terms of  $n$  for the number of dots in the sequence.

$$a_n = -2n + 9$$



