Name:_____Date:_____Per:_____

2.2 Inductive and Deductive Reasoning

1. Explain why a conjecture may be true or false.

For 2-13, use inductive reasoning to find the next term in each sequence.

2. March, May, July…

3. $\frac{1}{3}, \frac{2}{4}, \frac{3}{5}, \ldots$

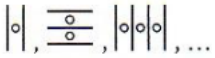
4. 75, 64, 53, …

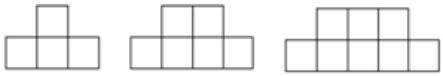
5. 8 a.m., 11 a.m., 2 p.m., …

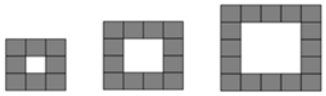
6. 1, 10, 100, 1000, …

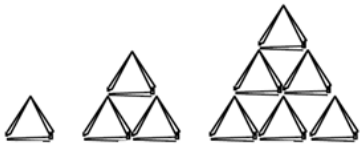
7. 1, 1, 2, 3, 5, 8, 13, …

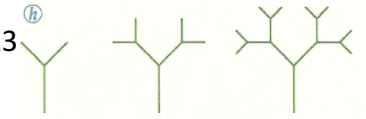
8. 

9. 

10. 

11. 

12. 

13. 

For 14-17, make and test a conjecture about the given quality.

14. the difference of any two even integers

15. the product of three negative numbers

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16. A laboratory culture contains 150 bacteria. After twenty minutes, the culture contains 300 bacteria. After one hour, the culture contains 1200 bacteria. Make a conjecture about the rate at which the bacteria increases.

17. About 5% of the students at Lincoln High School usually participate in the robotics competition. There are 526 students in the school this year. Make a conjecture about the number of students who will participate in the robotics competition this year.

For 18-28, give a counterexample that disproves each conjecture below.

18. No triangles have two sides of the same length.

19. No women have been elected U.S. senators.

20. All basketball players are more than 6 feet tall.

21. If you live in Texas, then you live in Houston.

22.If it is a cell phone, then it has a touch screen.

23. If x is any number, then $x^2 > 2$.

Name:_____Date:_____Per:_____

24. If $x \geq 0$, then $x+2=7$.

25. If $x^2 = 16$, then $x=4$.

26. All figures with four sides of equal length are squares.

27. The square of a number is larger than the number.

28. If a number is prime, then it is an odd number.

Name _____ Period _____

Inductive Vs Deductive Reasoning Worksheet

Definitions:

Inductive Reasoning: Making a general statement based on a number of observations (Guessing. Look for a pattern.)

Deductive Reasoning: Using known facts, definitions, and accepted properties in logical order to reach a conclusion or to show that a statement is true (Proving. Makes a rule.)

Were the following statements made by Inductive or Deductive Reasoning?

1. A chemistry experiment produces the same result 20 times. You conclude that it will always produce the same result.

2. Tim is Veronica's cousin. Since David is Veronica's twin brother, Tim is also David's cousin.

3. The school librarian notices that many students are requesting books about different countries in Africa. The librarian concludes that one of the social studies classes must be studying about Africa.

4. Julie notices that each term in the sequence 1, 3, 9, 27, …. Is found by multiplying the previous term by three. She concludes that the next two terms are 81 and 243.

5. Given the sequence 19, 23, 27, and 31 you conclude that the next term will be 35.

6. We know that all men are mortal. Since John is a man, John is mortal.

7. All of the people that you met in town are very strange. You conclude that everyone in town is very strange.

Identify each as either A: inductive or B: deductive reasoning.

1. You take 3 things and add them to 5 more things and count that you have 8 things. You repeat this several times and conclude that 3+5=8.

2. You know that between two points there is exactly one line. You have two points, so you conclude you must have one line between them.

3. You know that your ipod battery is low. It suddenly shuts off. You conclude that your ipod battery must have died.

4. Using postulates theorems and definitions to draw conclusions.

5. Using specific examples to reach a general conclusion.

6. Whenever you forget to feed your goldfish it dies. You conclude that if you don't feed your fish it will die.

7. You know that if lines are parallel then alternate interior angles are equal. Your lines are parallel so you conclude that your alternate interior angles are equal.

8. You add up the interior angles of a bunch of quadrilaterals and get 360° every time. You conclude that the sum of the interior angles of all quadrilaterals is 360°.

9. The pen you had in your backpack is missing. You see your friend using a pen that looks like it. You conclude that your friend stole your pen, and you will be mad at him until lunch.

10. The sum of the squares of the sides of a triangle is equal to the square of the third side. You conclude that the triangle must be a right triangle.

11. The sum of two sides of a triangle add up to be greater than the third side. You conclude that the triangle does in fact exist.

12. Every time you do all your homework your grades improve. You conclude that doing homework improves your grades.

13. The area of a parallelogram is bh. The base is 12 and the area is 24. You conclude that the height is 2.

14. You notice that every time you draw a triangle with the same 3 side lengths 5cm,6cm, and 7cm, the triangles are congruent. You conclude that all triangles with the same 3 side lengths are congruent.

15. You go fishing, and every time you fish in a certain hole you never catch anything. You conclude that there are no fish in that hole.

16. You know that an isosceles triangles has two equal sides. You see a triangle that has two equal sides and conclude that it is isosceles.

17. Every time you eat fast food your stomach feels funny. You conclude that fast food makes your stomach feel funny.

18. You see a series of numbers, 1,3,5,7,... You conclude the next number is a 9.

#1.	#2.	#3.	#4.	#5.	#6.	#7.	#8.	#9.	#10	#11	#12.	#13	#14	#15	#16	#17	#18
○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A	○A
○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B	○B