

Name: \_\_\_\_\_

Unit 2: Logic & Proof



Date: \_\_\_\_\_ Per: \_\_\_\_\_

Homework 1: Inductive Reasoning

**\*\* This is a 2-page document! \*\***

**Directions:** Find the next five terms, then write a conjecture.

1. 13, 18, 23, 28, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

2. 512, 256, 128, 64, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

3. 1, 8, 27, 64, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

4. 2, 3, 5, 7, 11, 13, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

5. I, II, III, IV, V, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

6. 1, 1, 2, 3, 5, 8, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

7.  $\uparrow$ ,  $\rightarrow$ ,  $\downarrow$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Conjecture:** \_\_\_\_\_  
\_\_\_\_\_

**Directions:** Determine if each conjecture is true or false. If false, provide a counterexample.

8. The sum of any two consecutive prime numbers is also prime.

9. The product of two even numbers is always divisible by 4.

10. The difference between two negative numbers is always negative.

11. For any integer  $x$ ,  $x^2 - x$  will always result in an even value.

12. For any two integers  $x$  and  $y$ ,  $|x + y| = |x| + |y|$

13. If  $LM = MP$ , then  $M$  must be the midpoint of  $\overline{LP}$ .

14. All birds can fly.

15. The difference between consecutive perfect square numbers is always odd.

16. For any two integers  $a$  and  $b$ ,  $(a + b)^2 = a^2 + b^2$