


# Reasoning and Proof – Inductive Reasoning

Hw Section 2.1

Name \_\_\_\_\_

If the given statement is not in if-then form, rewrite it. Identify the hypothesis and the conclusion. Then write the converse, inverse, and contrapositive.


1. *If a figure is a rectangle, then it has four sides.*

- a. If-Then Conditional statement: \_\_\_\_\_ 
- b. Hypothesis: a figure is a rectangle
- c. Conclusion: it has four sides
- d. Converse: If a figure has four sides, then it is a rectangle
- e. Inverse: If a figure is not a rectangle, then it does not have 4 sides
- f. Contrapositive: If a figure does not have four sides, then it is not a rectangle

2. *All Europeans live in Germany.*

- a. If-Then Conditional statement: If you are European, then you live in Germany
- b. Hypothesis: you are European
- c. Conclusion: you live in Germany
- d. Converse: If you live in Germany, then you are European.
- e. Inverse: If you are not European, then you don't live in Germany.
- f. Contrapositive: If you don't live in Germany, then you are not European.

3. *If  $x = -6$ , then  $|x| = 6$ .*

- a. If-Then Conditional statement: \_\_\_\_\_ 
- b. Hypothesis:  $x = -6$
- c. Conclusion:  $|x| = 6$
- d. Converse: If  $|x| = 6$ , then  $x = -6$
- e. Inverse: If  $x \neq -6$ , then  $|x| \neq 6$
- f. Contrapositive: If  $|x| \neq 6$ , then  $x \neq -6$

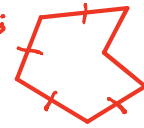
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Name \_\_\_\_\_

Determine the truth-value for the following statements. If a statement is false, give a counter example.

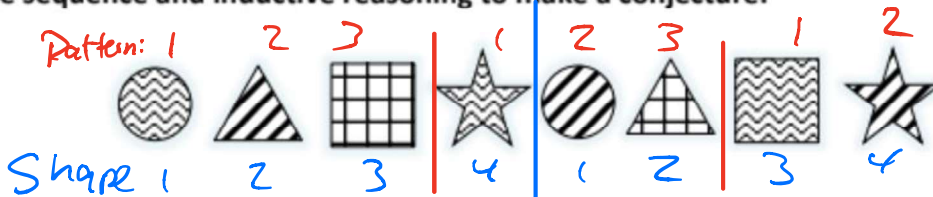
4. If an animal is a mammal, it lives on land. *False; Dolphin*
5. If a number is prime, then it is odd. *False; 2*
6. If your first name is Joe, then your last name is Mammah. *False; JOE DIET*
7. If the figure is a triangle, then the sum of the interior angles is  $180^\circ$ . *True*
8. If a figure has 4 congruent sides, then that figure is a square. *False;*



Find a pattern for each sequence. Use the pattern to find the next two terms.

9. 4, 4.5, 4.56, 4.567... *4.5678, 4.56789*
10. 1, -1, 2, -2, 3... *-3, 4*
11. J, F, M, A, M, ... *J, J* (with handwritten notes: sunny, ab, ash, pri, ay)

Use the sequence and inductive reasoning to make a conjecture:



12. What pattern is in the 15<sup>th</sup> figure?
13. What is the shape of the 12<sup>th</sup> figure?

$\frac{15}{3} = 5 \text{RO}$  checkerboard       $\frac{12}{4} = 3 \text{RO}$  STAR

Solve each equation for x!		Multiply!	Factor!
1. $3x - 3 = -6$  $3x = -3$ $x = -1$	2. $4x + 1 = 13x - 13$  $1 = 9x - 13$ $14 = 9x$ $\frac{14}{9} = x$	3. $x(x - 2) = x^2 - 2x$	4. $4x^3 - 8x^2$  $= 4x^2(x - 2)$
5. Graph the equation:  $y = -x + 3$			
6. Graph the equation:  $y = 1$			