Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Inductive and Deductive Reasoning!

Law of Detachment – Law of Syllogism

1. The law of detachment states that if a conditional is true and its hypothesis is true, then its \_\_\_\_\_\_ must also be true.

Use the Law of Detachment to draw a conclusion if possible.

2) -If two lines are parallel, then they do not intersect.

- Line a is parallel to line b.

3) -If three points lie on the same line, then they are collinear.

-Points A, B, and C lie on line l.

4) -If the measures of two angles have a sum of 90 [degrees](http://tutor-usa.com/free/geometry/worksheet/deductive-reasoning-law-detachment-law-syllogism" \t "undefined), then the angles are

complementary.  
 -m∠1+ m∠2 = 90

5) -If two figures are congruent, then their areas are equal.  
 -The area of ABCD equals the area of WXYZ

Write the hypothesis and conclusion of each conditional.

1) If it rains, then the game will be cancelled.

2) If you do not sleep, you will be tired.

3) AB = BC if B is the midpoint of AC .

4) If x = -2, then x2 = 4

Show that each conditional is false by finding a counterexample.

5) If an animal is a bird, then it is a penguin. 6) If x > 2, then x > 5

7) If a number is divisible by 2, then it is divisible by 4.

Write the converse of each statement. If the converse is true, write true. If the converse is false, give a counterexample.

8) If two angles are right angles, then they are congruent.

9) If x + 20 = 25, then x = 5.

Inverses & Contrapositives

Complete:

1) Given Statement: If p, then q.  
 Contrapositive: If not \_\_\_\_\_ , then not \_\_\_\_\_.  
 Converse: : If \_\_\_\_\_\_, then \_\_\_\_\_\_.  
 Inverse: If not \_\_\_\_\_, then not \_\_\_\_\_.

1. Given: A true conditional.  
   a) Must its converse be true?  
   b) Must its inverse be true?  
   c) Must its contrapositive be true?

Write the contrapositive and inverse of each statement.

4) If a polygon has six sides, then it is a hexagon.

6) If a polygon is a triangle, then the sum of the measures of its angles is 180.

Geometry  
Patterns & Inductive Reasoning

1. If the pattern continues, how many squares are in the 7th figure?

2) If the pattern continues, how many squares are in the 9th figure?

3) If the pattern continues, how many suns are in the 8th figure?

4) If the pattern continues, how many moons are in the 12th figure?

Explain the pattern. Then find the next three numbers in each pattern.

5) 2, 4, 6, 8, \_\_, \_\_, \_\_

6) 4, 0, 6, 2, \_\_, \_\_, \_\_

7) 3, -3, 3, -3, \_\_, \_\_, \_\_

8) 1, 1, 2, 3, 5, 8, 13, \_\_, \_\_, \_\_

9) A gumball machine gives you no gum if you insert 5ȼ, 5 gumballs if you insert 10ȼ, 10 gumballs if you insert 15ȼ, and 15 gumballs if you insert 20ȼ. How many gumballs could you expect to receive if you insert 35ȼ?

10) A pizza shop offers special prices for groups dining together. For the pizza buffet, the shop charges $10 for one person, $20 for two people, $29 for three, $37 for four, and so on. How much does a buffet dinner for 10 people cost?

How much does the group save by eating together rather than alone?