Name_____Per_____Col____Date_____

Geometry Worksheet section 2-3

Tell whether the reasoning process is deductive or inductive.

1. Linda observes that $(-1)^2 = 1$, $(-1)^4 = 1$, and $(-1)^6 = 1$. She concludes that every even power of (-1) is equal to 1.

   _____

2. Karl uses the definitions of square and of perimeter to conclude that the perimeter of every square Is four times the length of a side.

   _____

Make a conjecture based on the given statements and the Law of Syllogism.

3. If a triangle is scalene, then it has no congruent sides. If a triangle has no congruent sides, then it has no congruent angles. Triangle *BIG* is scalene.

_____

4. If two angles form a linear pair, then they are supplementary. If two angles are supplementary, then their measures have a sum of 180°. Angle 1 and ∠2 form a linear pair.

_____

State the hypothesis (*p*) and conclusion (*q*) of each given conditional. Then tell whether the conjecture is valid or not valid by the Law of Detachment.

5. Given: If a person sees penguins, then the person is in Antarctica.

   Carlos sees penguins.

   Conjecture: Carlos is in Antarctica.

   Hypothesis: _____

   Conclusion: _____

   The conjecture is _____ .

6. Given: If two angles are vertical angles, then they are congruent.

   Angle 3 and ∠4 are congruent.

   Conjecture: Angle 3 and ∠4 are vertical angles.

   Hypothesis: _____

   Conclusion: _____

   The conjecture is _____

Make a conclusion based on the Law of Detachment.

7. Right triangles have exactly one angle with measure 90°. Triangle *HOP* is a right triangle.

_____

Reword the given statement in if-then form and illustrate it with a Venn diagram. What can you conclude by using the given statement together with each lettered statement? If no conclusion is possible, write "no conclusion".

7. Given: All football players wear uniforms.

If-then_____

a. Mason is a football player.

Venn Diagram

_____

b. Mike wears a uniform.

_____

c. Ryker does not play football.

_____

d. Mrs. Bryant does not wear a uniform.

_____

Write the converse, inverse, and contrapositive of the given conditional. Tell whether each statement is true or false.

9. If an angle is obtuse, then it is not acute.

Converse_____

Inverse_____

Contrapositive_____

Draw a counterexample that shows why the conclusion is false.

10. If $AM = MB$, then M is the midpoint of $\overline{AB}$.