Name: Key **Period:** ____ **Date:** ____

1.5 – 1.6 Conditional Statements and Deductive Reasoning WS

In questions 1-4, underline the hypothesis and circle the conclusion in each conditional statement. Then decide if the statement is TRUE or FALSE. If it is false, identify a counterexample.

1. If a student at IHS has Geometry this year, then the student's teacher is Mrs. Karpenko.

TRUE or FALSE If false, a counterexample is the student could have Mr. Blaskie.

---

2. If the product of two whole numbers is even, then the two numbers were both even.

TRUE or FALSE If false, a counterexample is the #s could be 1 and 2 since (1)(2)=2.

---

3. A person has a fever if their body temperature is 103° F.

TRUE or FALSE If false, a counterexample is _____.

---

4. If the sum of two whole numbers is odd, then one of the numbers is odd and the other is even.

TRUE or FALSE If false, a counterexample is _____.

In questions 5-7, write the converse of the given conditional statement. Then decide if the converse is TRUE or FALSE. If it is false, identify a counterexample or draw a picture of a counterexample.

5. If all three sides of a triangle have different lengths (p), then the triangle is scalene (q).

Converse: If a triangle is scalene, then all three of its sides have different lengths.

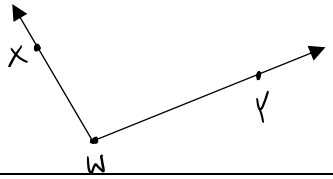
TRUE or FALSE If false, a counterexample is

---

6. Two rays share the same endpoint (q) if they are opposite rays (p).

Converse: If two rays share the same endpoint, then they are opposite rays.

TRUE or FALSE If false, a counterexample is



$\overrightarrow{WX}$ and $\overrightarrow{WY}$ share point W but aren't opposite rays.

---

7. Three points are collinear (q) if they lie on the same plane (p).

Converse: If three points are collinear, then they lie on the same plane.

TRUE or FALSE If false, a counterexample is

For questions 8-9, help order the steps someone took when correctly solving algebraic problems. Write a "1" to indicate the first step, a "2" for the second step, and so on.

8. $5x-18=3(x+2)$

$2x-18=6$	2
$2x=24$	3
$5x-18=3x+6$	1
$5x-18=3(x+2)$	GIVEN
$x=12$	4

9. $4|2x+3|=36$

$x=3$ or $x=-6$	4
$\|2x+3\|=9$	1
$2x+3=9$ or $2x+3=-9$	2
$2x=6$ or $2x=-12$	3
$4\|2x+3\|=36$	GIVEN

For question 10, use the table below to fill in the missing steps and reasons of the deductive argument.

Algebraic Proof A list of algebraic steps to solve problems where each step is justified is called an **algebraic proof**, The table shows properties you have studied in algebra.

The following properties are true for any real numbers *a*, *b*, and *c*.

Addition Property of Equality	If $a = b$, then $a + c = b + c$.
Subtraction Property of Equality	If $a = b$, the $a - c = b - c$.
Multiplication Property of Equality	If $a = b$, then $a \cdot c = b \cdot c$.
Division Property of Equality	If $a = b$ and $c \neq 0$, then, $\frac{a}{c} = \frac{b}{c}$.
Reflexive Property of Equality	$a = a$
Symmetric Property of Equality	If $a = b$ and $b = a$.
Transitive Property of Equality	If $a = b$ and $b = c$, then $a = c$.
Substitution Property of Equality	If $a = b$,then a may be replaced by b in any equation or expression.
Distributive Property	$a(b + c) = ab + ac$

10. $2(4x-6)=x+37$

Step	Reason
1. $2(4x-6)=x+37$	1. Given
2. $8x-12=x+37$	2. Distributive Property
3. $8x=x+49$	3. Addition Property of Equality
4. $7x=49$	4. Subtraction Property of Equality
5. $x=7$	5. Division Property of Equality