**Name: _____ 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 _____.

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**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 _____.

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

TRUE or FALSE If false, a counterexample is _____.

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**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 _____.

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**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, then the triangle is scalene.

Converse: _____

TRUE or FALSE If false, a counterexample is

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**6.** Two rays share the same endpoint if they are opposite rays.

Converse: _____

TRUE or FALSE If false, a counterexample is

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**7.** Three points are collinear if they lie on the same plane.

Converse: _____

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

| | |
|---|---|
| $2x-18=6$ | _____ |
| $2x=24$ | _____ |
| $5x-18=3x+6$ | _____ |
| $5x-18=3(x+2)$ | **GIVEN** |
| $x=12$ | _____ |

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

| | |
|---|---|
| $x=3$ or $x=-6$ | _____ |
| $\|2x+3\|=9$ | _____ |
| $2x+3=9$ or $2x+3=-9$ | _____ |
| $2x=6$ or $2x=-12$ | _____ |
| $4\|2x+3\|=36$ | **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. | 2. Distributive Property |
| 3. $8x=x+49$ | 3. |
| 4. | 4. |
| 5. | 5. Division Property of Equality |