# Vocabulary – Chapter 2

**Conditional** → Statement formed by joining two statements, sometimes referred to as *p* and *q*, with the words *if* and *then*. $(p \Rightarrow q)$

hypothesis (*p*) → "If" clause of a conditional statement.
conclusion (*q*) → "then" clause of a conditional statement.

**Converse** → The statement formed by switching the hypothesis and the conclusion of a given conditional. Sometimes written as $(q \Rightarrow p)$.

**Inverse** → statement formed by negating both the hypothesis and the conclusion of the Conditional. $(\sim p \Rightarrow \sim q)$

**Contrapositive** → Statement formed by negating both the hypothesis and the conclusion of the Converse. $(\sim q \Rightarrow \sim p)$

**Conjecture** → an educated guess. In other words, an assumption based on data collected (Hypothesis).

**Counterexample** → an example (only ONE) that shows a conjecture or conditional to be false.

**Inductive Reasoning** → Process of observing data, recognizing patterns, and then making a generalization or conjecture from the observations.

**Deductive Reasoning (logical reasoning)** → Process in which if certain statements (Definitions, Postulates, Theorems, and Properties) are true, then other statements can be shown to follow from them.

# Algebra Properties

<u>Postulates of Equality and Inequality</u>

Reflexive Property → $a=a$

Symmetric Property → If $a=b$, then $b=a$.

Transitive Property → If $a=b$ and $b=c$, then $a=c$.
→ If $a<b$ and $b<c$, then a<c.

<u>Postulates involving Operations</u>

Addition Property → If $a=b$, then $a+c = b+c$.
→ If $a<b$, then $a+c < b+c$.

Multiplication Property →
a) Equality: If $a=b$, then $ac = bc$.
b) Inequality: If $a<b$ and $c>0$, then $ac < bc$.
If $a<b$ and $c<0$, then $ac > bc$.

<u>Postulates involving Equality</u>

Substitution Property →
If $a=b$, then $a$ may be substituted for $b$ in any expression.

**Proof** → An argument for a conditional (stmt) in which a logical sequence of **statements** is stated with supporting **justifications** (reasons) for those statements.

Diagram

Two-Column Proof:
Given: (what is given to be true)
To Prove: (what you want to show is true)

| Statements | Reasons |
|---|---|
| 1. (*what follows the* Given:) | 1. Given |
| 2. | 2. |
| 3. last stmt—always what is to be proven | 3. also a reason—def., post., thm. |

## Theorems:

If two angles form a linear pair, then they are supplementary angles.

Congruence of segments is reflexive, symmetric, and transitive.

Congruence of angles is reflexive, symmetric, and transitive.

Angles supplementary to the same angle or to congruent angles are congruent.

Angles complementary to the same angle or to congruent angles are congruent.

All right angles are congruent.

Vertical angles are congruent.

Perpendicular lines intersect to form four right angles.

Transversal → Line that intersects two or more coplanar lines at different points.

Corresponding angles → Pair of nonadjacent angles—one interior, one exterior—both on the same side of the transversal.

Postulates:
*If two parallel lines are cut by a transversal, then the corresponding angles are equal in measure. (are congruent)
*If corresponding angles are equal in measure, then the lines are parallel.

Two non-vertical lines are parallel iff they have the same slope.

In a plane, if line *l* is parallel to line *m* and line *m* is parallel to line *n*, then line *l* is parallel to line *n*.