

**Connection: Form and Number Definitions**

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1		<b>Form</b>	<b>is to</b>	<b>Number</b>
2	a s	$\cong$	<b>is to</b>	$=$
3	a s	$\overline{AB}$	<b>is to</b>	<b><i>AB</i></b>
4	a s	$\angle DFG$	<b>is to</b>	$m\angle DFG$
5	a s	complementary, supplementary: “merging forms to right angle or straight angle”	<b>is to</b>	complementary, supplementary: “measures add to 90° and 180°”
6	a s	perpendicular lines: “lines meeting to form adjacent congruent angles (Euclid)”	<b>is to</b>	perpendicular lines: “lines meeting to form 90° angles or angles of equal measure”
7	a s	straight angle: “union of opposite rays with a common vertex”	<b>is to</b>	straight angle: “angle with measure of 180°”
8	a s	diameter: “chord containing the center”	<b>is to</b>	diameter: “ chord with measure = 2r”
9	a s	parallel lines (in a plane) and parallel planes: “never intersecting”	<b>is to</b>	parallel lines and planes: “everywhere equidistant”
10	a s	MEDIAN CONSTRUCTION	<b>is to</b>	EQUATION OF MEDIAN
11	a s	ALTITUDE CONSTRUCTION	<b>is to</b>	LENGTH/EQUATION OF ALTITUDE
12	a s	PARALLEL LINES BY CONSTRUCTION	<b>is to</b>	PARALLEL LINES BY EQUAL SLOPES
13	a s	PERPENDICULAR LINES BY CONSTRUCTION	<b>is to</b>	PERPENDICULAR LINES BY SLOPE RELATIONSHIP

1 4	a s	“TAPESTRY” ACTIVITY COLUMN	<b>is to</b>	“TAPESTRY” ANALYSIS COLUMN
1 5	a s	?	<b>is to</b>	?

Discussion

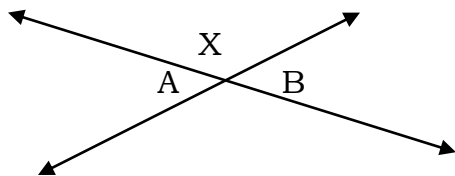
The original idea for the page-one chart is a “sound-bite” definition of mathematics:

*Mathematics is the study of the invariant (unchanging) aspects of number and form.*

Geometry lends itself strongly to study of both number and form.

The proof aspect of a geometry course, for example, allows for use of both the number definition of an idea and the form definition of the same idea to justify steps in the same two-column proof. An example follows.

**Theorem:** Vertical angles are congruent.



**Statement**

**Given:** Vertical angles A and B as shown.

**Prove:**  $\angle A \cong \angle B$

**Reasons**

- |   |                             |
|---|-----------------------------|
| 1. Vertical angles A and B as shown.  | 1. Given                    |
| 2. $\angle A, \angle X$ are supplementary;<br>$\angle B, \angle X$ are supplementary                              | 2. “Supplementary” (form)   |
| 3. $m\angle A + m\angle X = 180^\circ$ ;<br>$m\angle B + m\angle X = 180^\circ$                                   | 3. “Supplementary” (number) |
| 4. $m\angle A + m\angle X = m\angle B + m\angle X$<br>$\quad \quad \quad -m\angle X \quad \quad \quad -m\angle X$ | 4. Transitive               |
| 5. $m\angle A = m\angle B$  | 5. Subtraction              |
| 6. $\angle A \cong \angle B$  | 6. “ $\cong$ ”              |