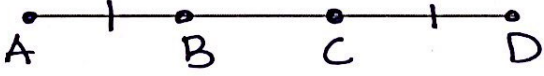


H.Geometry – Chapter 2 – Definition Sheet

Section 2.4 (day 1)

<p>Inductive Reasoning</p>	<ul style="list-style-type: none"> Using discovery may tell us what we think <u>may</u> be true, but it does not tell us <u>why</u> it is true. Prove a conjecture true by exploring all possibilities as instances or using <u>deductive reasoning</u>.
<p>Deductive Reasoning</p>	<ul style="list-style-type: none"> The process of showing certain statements must follow <u>logically</u> from agreed upon assumptions and proven facts. Example: <u>Lawyers</u> <p>- conclusion is true if:</p> <ul style="list-style-type: none"> initial statements are true. all statements following are true. statements can be supported by facts.
<p>Overlapping Segments Conjecture</p>	<ul style="list-style-type: none"> If \overline{AD} has points A, B, C, and D in that order, with $\overline{AB} \cong \overline{CD}$, then the overlapping segments <u>\overline{AC}</u> and <u>\overline{BD}</u> are congruent. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> This is a conjecture, we will need to prove this using deductive reasoning.
<p>Theorem</p>	<ul style="list-style-type: none"> A statement <u>deductively</u> proved to be true from <u>definitions</u>, <u>postulates</u> and previously proven theorems.
<p>Postulate</p>	<p>An unprovable statement assumed to be true.</p>

Deductive Examples:

(1) All oranges are fruit, All fruit grow on trees \therefore all oranges grow on trees.

(2) Birds have feathers and Robins are birds \therefore robins have feathers.

H. Geometry – Chapter 2 – Definition Sheet

Conclusions	statements that are deduced
Justifications	Known laws and <u>properties</u> that are used to demonstrate that conclusions are <u>true</u> . "back up your thinking"
Justifying Conclusions	Must use: (1) definitions (2) postulates (assumptions) (3) theorems (proven statements)
Proofs	A series of <u>justified conclusions</u> leading from given info. to a desired result.

Postulates (Properties) of Algebra

	OF EQUALITY	OF CONGRUENCE
* <u>Reflexive</u> Property (DU#)	$a = a$ $PQ = PQ$ $5 = 5$	$\overline{AB} \cong \overline{AB}$ $\angle 3 \cong \angle 3$ $\triangle XYZ \cong \triangle XYZ$
<u>Symmetric</u> Property	If $a = b$, then $b = a$ If $x = 5$, then $5 = x$	If $\angle 1 \cong \angle 2$, then $\angle 2 \cong \angle 1$
* <u>Transitive</u> Property	If $a = b$ and $b = c$, then $a = c$	If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, * then $\angle 1 \cong \angle 3$ *
* <u>Substitution</u> Property	If $a = b$, then a can be substituted for b in any expression.	If $AB + BC = 23$ and $AB = 10$, → then $10 + BC = 23$.

H. Geometry - Chapter 2 - Definition Sheet

Postulates (Properties) of Algebra

* ONLY TWO *

OF EQUALITY

OF CONGRUENCE

<p><u>Addition</u> Property POE</p>	<p>If $a=b$, then $a+c = b+c$. Add same thing to both sides... *works w/subtraction</p>	<p>If $x-5=12$, then $x-5+\underline{5}=12+\underline{5}$ $x=17$</p>
<p><u>Multiplication</u> Property POE</p>	<p>If $a=b$, then $ac=bc$ Multiply same thing to both sides. *WORKS w/division.</p>	<p>If $\frac{1}{3}y=10$, then $3 \cdot \frac{1}{3}y = 3 \cdot 10$ $y=30$</p>

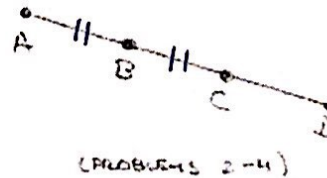
1. JUSTIFY EACH STEP WHEN SOLVING:

$$\begin{array}{r} 2x + 46 = 30 \quad \text{given} \\ -46 \quad -46 \quad \text{addition POE} \end{array}$$

$$\frac{2x}{2} = \frac{-16}{2} \quad \text{multiplic. POE}$$

$$\boxed{x = -8}$$

2. IF B IS THE MIDPOINT OF \overline{AC} , MAKE A CONCLUSION BASED ON THE DEFIN. OF MIDPOINT. $\overline{AB} \cong \overline{BC}$



3. IF $AB = BC$, AND $BC = CD$, MAKE A CONCLUSION BASED ON THE TRANSITIVE PROP.
 $AB = CD$

4. IF $AB + BC = 18$, AND $AB = CD$, MAKE A CONCLUSION BASED ON THE SUBSTITUTION PROPERTY

$$CD + BC = 18$$

5. \overline{BC} BISECTS $\angle ABD$. MAKE A CONCLUSION AND JUSTIFY IT.
 $\angle ABC \cong \angle CBD$ by defn. of \angle bisector



6. $\angle 1 \cong \angle 2$. MAKE A CONCLUSION AND JUSTIFY IT.
 $m\angle 1 = m\angle 2$ defn. of $\cong \angle$'s.

