

H.Geometry - Chapter 2 - Definition Sheet

Section 2.4 (day 2)

Conclusions	statements that are deduced
Justifications	known laws and properties that are used to demonstrate that conclusions are true "back up your thinking"
Justifying Conclusions	Must use: <ol style="list-style-type: none"> (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	$a = a$ $PQ = PQ$ $5 = 5$	$\overline{AB} \cong \overline{AB}$ $\angle 3 \cong \angle 3$ $\triangle XYZ \cong \triangle XYZ$
<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 $XY = JK$ and $JK = AB$, then $XY = AB$	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 $10 + BC = 23$

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Postulates (Properties) of Algebra

ONLY TWO

OF EQUALITY

OF CONGRUENCE

<p><u>Addition</u> Property</p>	<p>If $a=b$, then $a+c=b+c$ (The same thing can be added to both sides of an equation, retaining equality) *works with subtraction</p>	<p>If $x-5=12$, then $x-5+5=12+5$ or $x=17$</p>
<p><u>Multiplication</u> Property</p>	<p>If $a=b$, then $ac=bc$ (the same thing multiplied on both sides of equation, retaining equality) *works for division</p>	<p>If $\frac{1}{3}y=10$, then $\underline{3} \cdot \frac{1}{3}y = \underline{3} \cdot 10$ If $6h=42$, then $\frac{6h}{6} = \frac{42}{6}$ $h=7$</p>

1. JUSTIFY EACH STEP WHEN SOLVING:

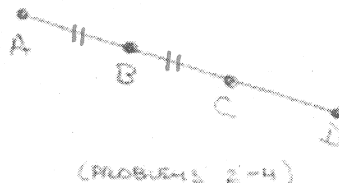
$$2x + 46 = 30 \text{ given}$$

$$\begin{array}{r} 2x + 46 = 30 \\ -46 \quad -46 \\ \hline 2x = -16 \end{array}$$

-46 addition POE
multiplication POE

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

2. IF B IS THE MIDPOINT OF AC, MAKE A CONCLUSION BASED ON THE DEFN. 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 $\overline{AB} + \overline{BC} = 18$, AND $\overline{AB} = \overline{CD}$, MAKE A CONCLUSION BASED ON THE SUBSTITUTION PROPERTY

$$CD + BC = 18$$

5. \overrightarrow{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.

$$m\angle 1 = m\angle 2 \text{ by defn. of}$$

congruent angles.

