

# Notes 2.6

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Multiplication & Division Properties

# Multiplication & Division Theorems

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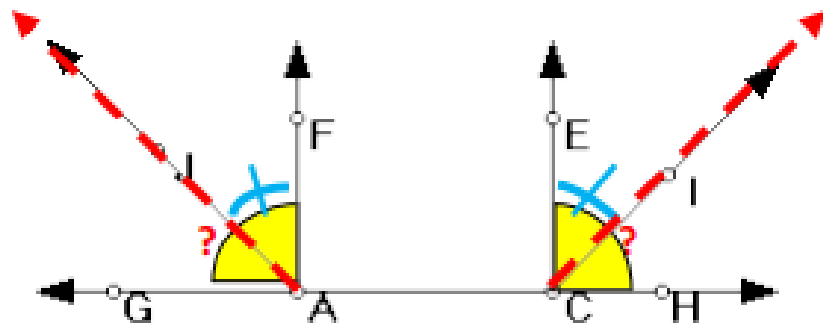
- **Theorem 14:** if segments (or angles) are congruent, then their like multiples are congruent.
- **Theorem 15:** if segments( or angles) are congruent, then their like divisors are congruent.
  - Ie. If congruent segments (or angler) are bisected or trisected, then the parts of these segments (or angels) are congruent.

# CAUTION!!!!

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- Don't confuse Addition and Subtraction with Multiplication and Division!!
- Look for multiplication and division keywords.....
  - midpoint, bisect, trisect.....

# Example: Division Property



Given:  $\angle GAF \cong \angle HCE$

$\overrightarrow{AJ}$  bisects  $\angle GAF$ ,  $\overrightarrow{CI}$  bisects  $\angle HCE$

Prove:  $\angle GAJ \cong \angle HCI$

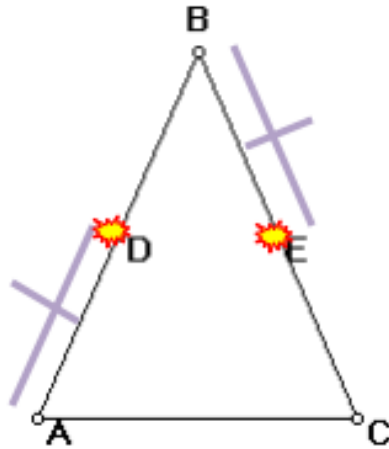
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|----|--|-------------|
| 1. | $\angle GAF \cong \angle HCE$              | 1. Given    |
| 2. | $\overrightarrow{AJ}$ bisects $\angle GAF$ | 2. Given    |
| 3. | $\overrightarrow{CI}$ bisects $\angle HCE$ | 3. Given    |
| 4. | $\angle GAJ \cong \angle HCI$              | 4. Division |

# Example: Multiplication Property

**Given:**  $\overline{AD} \cong \overline{BE}$

*D and E are midpoints of  $\overline{AB}$  and  $\overline{BC}$*

**Prove:**  $\overline{AB} \cong \overline{BC}$



*Statements*

*Reasons*

1.  $\overline{AD} \cong \overline{BE}$

1. Given

2. D is **mdpt** of  $\overline{AB}$

2. Given

3. E is **mdpt** of  $\overline{BC}$

3. Given

4.  $\overline{AB} \cong \overline{BC}$

4. (Multiplication)

## BE ALERT!

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- Notice that division OR multiplication is used whenever there is a **DOUBLE USE** of the words bisect, trisect or midpoint (or as in the last example, whenever a double use can be inferred from a “given”!)