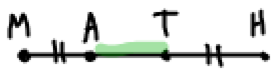
2.5. Honors Geometry DATE: 10/15/12

Target 2D. Understand and apply geometric properties of equality and congruence

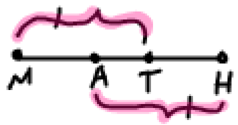
An ∠ or segment ≅ to itself is called Reflexive.
Ex: • $\overline{AT} \cong \overline{AT}$
• $\angle CBE \cong \angle CBE$

- If a segment is added to 2 ≅ segments, then the sums are ≅.

(Addition property of segments)

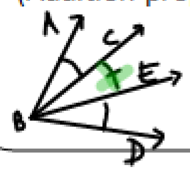


$\overline{MA} \cong \overline{TH}$
⊕ $\overline{AT} \cong \overline{AT}$
$\overline{MT} \cong \overline{AH}$

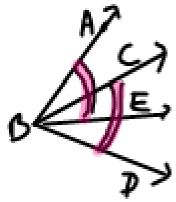


- If an ∠ is added to 2 ≅ ∠s, then the sums are ≅.

(Addition property of ∠s)

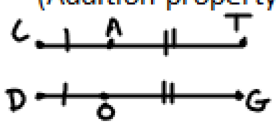


$\angle ABC \cong \angle EBD$
⊕ $\angle CBE \cong \angle CBE$
$\angle ABE \cong \angle CBD$

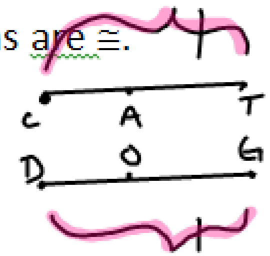


- If ≅ segments are added to ≅ segments, then the sums are ≅.

(Addition property of segments)

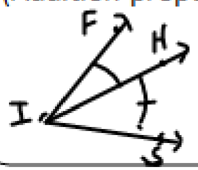


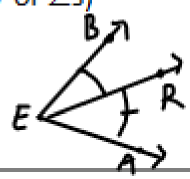
$\overline{CA} \cong \overline{DO}$
⊕ $\overline{AT} \cong \overline{OG}$
$\overline{CT} \cong \overline{DG}$



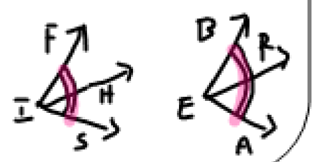
- If ≅ ∠s are added to ≅ ∠s, then the sums are ≅.

(Addition property of ∠s)

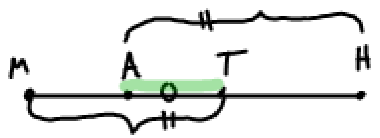




$\angle FIH \cong \angle BER$
⊕ $\angle HIS \cong \angle REA$
$\angle FIS \cong \angle BEA$

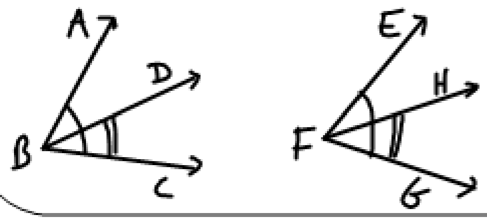


- If a segments (or ∠) is subtracted from ≅ segments (or ∠s), then the differences are ≅. * Making a pic for seg. Same thing can be done for ∠s!
  (Subtraction property)

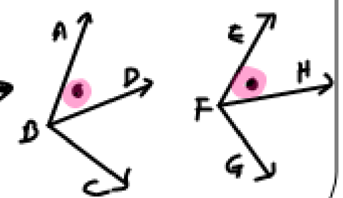


$$\begin{array}{l} \ominus\ \overline{MT} \cong \overline{AH} \\ \quad\ \overline{AT} \cong \overline{AT} \\ \hline \quad\ \overline{MA} \cong \overline{TH} \end{array}$$

- If ≅ segments (or ∠s) are subtracted from ≅ segments (or ∠s), then the differences are ≅. * Making a pic for ∠s. Same thing can be done for seg.
  (Subtraction property)



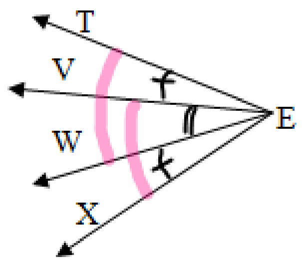
$$\begin{array}{l} \quad\ \angle ABC \cong \angle EFG \\ \ominus\ \angle DBC \cong \angle HFG \\ \hline \quad\ \angle ABD \cong \angle EFH \end{array}$$



Examples

Given: $\angle TEV \cong \angle XEW$

Prove: $\angle TEW \cong \angle XEV$



Statement	Reason
① $\angle TEV \cong \angle XEW$	① Given
② $\angle VEW \cong \angle VEW$	② Reflexive property of $\angle$s.
③ $\angle TEW \cong \angle XEV$	③ If an $\angle$ is added to $\cong$ $\angle$'s, then the sum is $\cong$. (Add. prop. of $\angle$s)

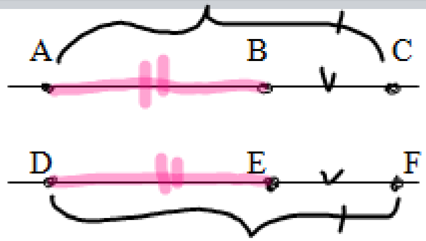
Given: $\overline{AC} \cong \overline{DF}$

2.5 Addition & SubtractionProperites [Compatibility Mode] - Microsoft Word

Given: $\overline{AC} \cong \overline{DF}$

$\overline{BC} \cong \overline{EF}$

Prove: $\overline{AB} \cong \overline{DE}$



Statement	Reason
① $\overline{AC} \cong \overline{DF}$	① Given
② $\overline{BC} \cong \overline{EF}$	② Given
③ $\overline{AB} \cong \overline{DE}$	③ If $\cong$ seg. are subtracted from $\cong$ seg., then their differences are $\cong$. (Subtraction property of segments)

<u>Rule of Thumb</u>

1. Use addition when conclusion is bigger than the given info.
2. Use subtraction when conclusion is smaller than the given info.

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