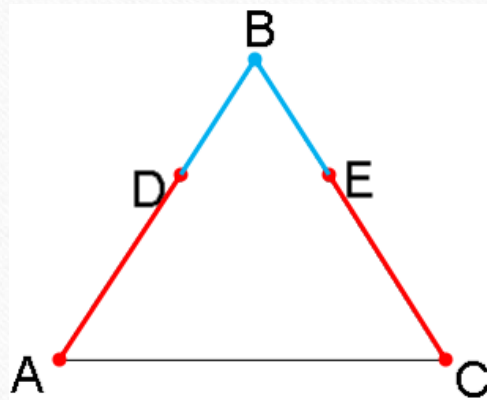# NOTES 2.5

ADDITION & SUBRTACTION PROPERTIES

Segment Addition Theorems

- **Theorem 8**: If a segment is added to two congruent segments, the sums are congruent.

- **Theorem 10**: If congruent segments are added to congruent segments, then their sums are congruent.

Example: Theorems 8 and 10

- Given: AD ≅ EC and BD ≅ BE …. conclusion: ?

- Then AB ≅ BC (by addition ppty of segments)

Angle Addition Theorems

- **Theoerm** 9: If an angle is added to two congruent angles, the sums are congruent.

- **Theorem 11**: If congruent angles are added to ongruent angles, then their sumes are congruent.

Example: Theorems 9 and 11

- (Think . . .) If two pair of adjacent congruent angles are added together then the resulting angles must be congruent.
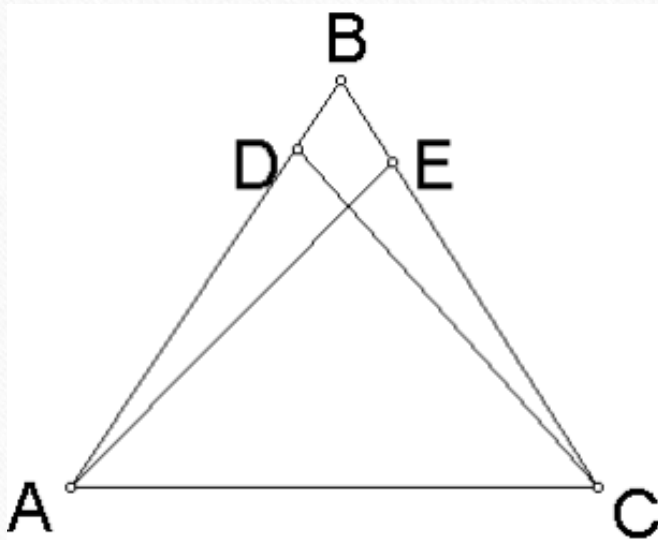
$\angle BAE \cong \angle BCD$ and $\angle EAC \cong \angle DCA$ then
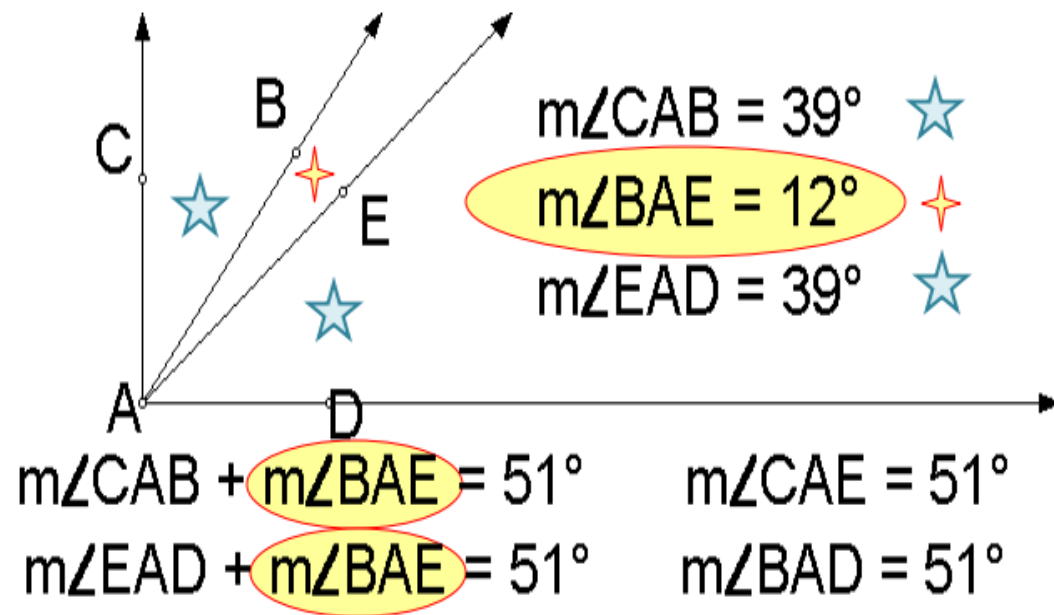$\angle BAC \cong \angle BCA$

Notice that…

$\angle BAC - \angle EAC = \angle BAE$ and $\angle BCA - \angle DCA = \angle BCD$

Segment and Angle Subtraction Properties

- **Theorem 12**: If a segment (or angle) is subtracted from congruent segments (or angles), the differences are congruent.

- **Theorem 13**: If congruent segments (or angles) are subtracted from congruent segments (or angles), the differences are congruent.

Example: Theorems 12 & 13

$m\angle CAB = 39°$ ☆

$m\angle BAE = 12°$ ✦

$m\angle EAD = 39°$ ☆

$m\angle CAB + m\angle BAE = 51°$ $m\angle CAE = 51°$

$m\angle EAD + m\angle BAE = 51°$ $m\angle BAD = 51°$

- Since ∡ BAE (✦) is being added to two angles that were said to be congruent in the first place(☆) , the resulting angles after the addition are also congruent.

Hints and Tricks

- An addition property is used whenever the resulting segments (or angles) are greater than what was given.

- A subtraction property was used whenever the resulting segments (or angles) are smaller than those that were given.