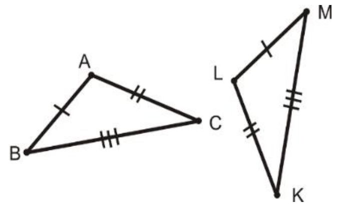
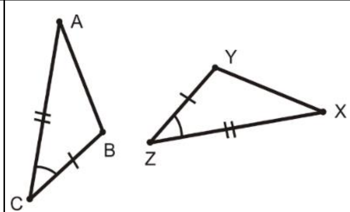
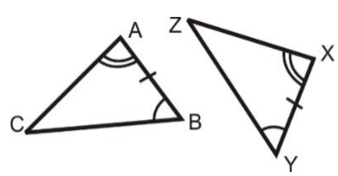
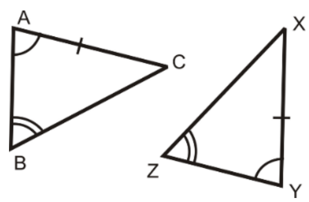
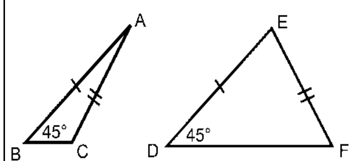
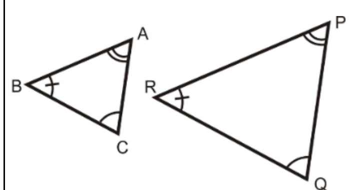
Triangle Congruence Properties

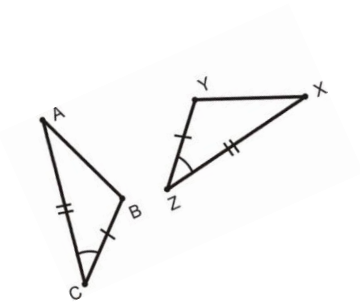
Need ______________________________ corresponding pairs of congruent parts to guarantee triangles are congruent!

Side-Angle Relationship	***Picture***	***Guarantees Congruence?***
SSS *SIDE–SIDE–SIDE* *Three pairs of congruent sides*		
SAS *SIDE–ANGLE–SIDE* *Two pairs of congruent sides and one pair of congruent angles (and the angles are between the pairs of sides)*		
ASA *ANGLE–SIDE–ANGLE* *Two pairs of congruent angles and one pair of congruent sides (and the sides are between the pairs of angles)*		
AAS (or SAA) *ANGLE– ANGLE–SIDE* *Two pairs of congruent angles and one pair of congruent sides (but the sides are NOT between the pairs of angles)*		
SSA (or ASS) *Two pairs of congruent sides and one pair of congruent angles (but the angles are NOT between the pairs of sides)*		**NO** **More than one triangle is possible.**
AAA *Three pairs of congruent angles*		**NO** **There is no guarantee the corresponding sides are congruent.**

<u>More on Triangle Congruence</u>

Once we find three corresponding pairs of congruent parts to ______________ ___________________________________, then we know_______________ corresponding parts of those congruent triangles are __________________!

Using SAS example from "Triangle Congruence Properties" Entry:



Before, we determined that:

$\overline{AC} \cong \overline{XZ}$

$\angle C \cong \angle Z$

$\overline{BC} \cong \overline{YZ}$

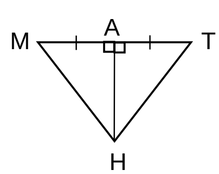
so, $\Delta ABC \cong \Delta XYZ$ by SAS.

Since the triangles are guaranteed to be congruent, then we can now guarantee that _____________, _____________, and _____________ because ____.

A few additional things may come up when trying to prove triangles congruent:

- Sometimes two triangles can SHARE a side. Even if they are not marked, these pieces can be guaranteed congruent because anything is congruent to ITSELF. In math, we call this the __________________________________.
- Sometimes in order to be clear about which specific angle we are referring to, we need to use a ____ letter name instead of a single letter. This is necessary when you have more than one angle with the same ______________.

<u>Example:</u> Is $\Delta MAH \cong \Delta TAH$?



There are two pieces marked:

$\overline{MA} \cong \overline{TA}$

__________________(To say $\angle A \cong \angle A$ would not be correct because they are NOT the exact same piece!)

Only two congruent corresponding parts is NOT enough information to ___________________________!

But, we also know ___________ by ____________________.

So we can conclude ____________________ by __________.