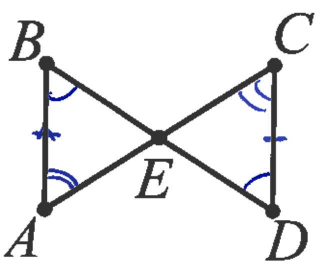
Geometry – Mr. Bo
Unit 4 - Day 3 Notes

Name:__________________________
Date:_____________________

Triangle Congruency Proofs
(SSS, SAS, ASA, AAS)

1. Given: $\overline{BA} \parallel \overline{DC}$
$\overline{BA} \cong \overline{DC}$

Prove: $\Delta BAE \cong \Delta DCE$

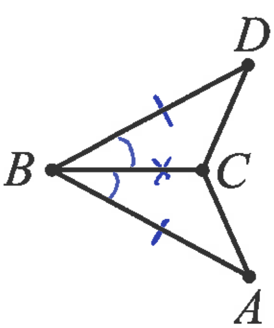


ASA

S	R
① $\overline{BA} \parallel \overline{DC}$	① Given.
② $\angle B \cong \angle D$ (Angle)	② 2 ∥ lines cut by a trans make alt. int ∠'s ≅.
③ $\overline{BA} \cong \overline{DC}$ (side)	③ Given
④ $\angle A \cong \angle C$ (Angle)	④ 2 ∥ lines cut by a trans make alt. int. ∠s ≅
⑤ $\Delta BAE \cong \Delta DCE$	⑤ ASA.

2. Given: $\overline{BC}$ bisects $\angle ABD$
$\overline{BD} \cong \overline{BA}$

Prove: $\Delta BDC \cong \Delta BAC$



SAS

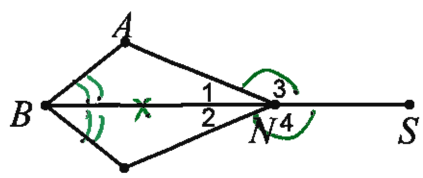
S.	R.
① $\overline{BD} \cong \overline{BA}$ (Side) $\overline{BC}$ bisects $\angle ABD$	① Given
② $\angle DBC \cong \angle ABC$ (Angle)	② ∠ bisector ÷ ∠ into 2 ≅ ∠'s
③ $\overline{BC} \cong \overline{BC}$ (side)	③ Reflexive.
④ $\Delta BDC \cong \Delta BAC$	④ SAS

3. Given: $\overline{BNS}$

$\angle 3 \cong \angle 4$ — not in △ so use supps.

$\angle ABN \cong \angle DBN$

Prove: $\Delta BAN \cong \Delta BDN$



ASA

S	R
① $\overline{BNS}$ $\angle 3 \cong \angle 4$ $\angle ABN \cong \angle DBN$ (Angle)	① Given
② $\overline{BN} \cong \overline{BN}$ (Side)	② Reflexive
③ $\angle 3$ supp $\angle 1$ $\angle 4$ supp. $\angle 2$	③ adj. $\angle$'s formed by 2 int lines are supp.
④ $\angle 1 \cong \angle 2$ (Angle)	④ $\cong$ $\angle$'s have $\cong$ supps.
⑤ $\Delta BAN \cong \Delta BDN$	⑤ ASA

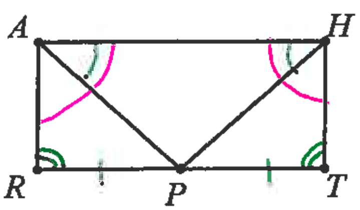
4. Given: $\overline{AP}$ bisects $\overline{RT}$ at P

$\angle RAH \cong \angle THA$

$\angle PAH \cong \angle PHA$

$\angle R \cong \angle T$

Prove: $\Delta RAP \cong \Delta THP$



AAS.

(using subtraction to get $\angle RAP \cong \angle THP$)

S	R
① $m\angle PAH = m\angle PHA$ $m\angle RAH = m\angle THA$	① Given
② $m\angle RAP + m\angle PAH = m\angle THP + m\angle PHA$	② Angle addition
③ $m\angle RAP + m\angle PHA = m\angle THP + m\angle PHA$	③ Substitution.
④ $m\angle RAP = m\angle THP$ (Angle)	④ Subtraction.
⑤ $\angle R \cong \angle T$ (Angle) $\overline{AP}$ bisects $\overline{RT}$ at P	⑤ Given
⑥ P midpt. of $\overline{RT}$	⑥ Seg. bisector goes through the midpt.
⑦ $\overline{RP} \cong \overline{PT}$ (Side)	⑦ midpt makes 2 $\cong$ segs.
⑧ $\Delta RAP \cong \Delta THP$	⑧ AAS