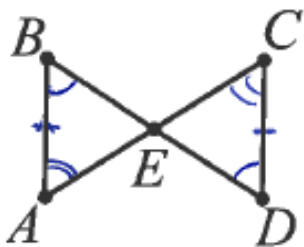


Triangle Congruency Proofs
(SSS, SAS, ASA, AAS)
1-2-1 Activity

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

Prove: $\triangle BAE \cong \triangle DCE$

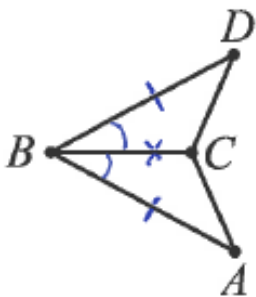


ASA

- | 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. \angle 's \cong . |
| 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. \angle 's \cong . |
| ⑤ $\triangle BAE \cong \triangle DCE$ | ⑤ ASA. |

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

Prove: $\triangle BDC \cong \triangle BAC$

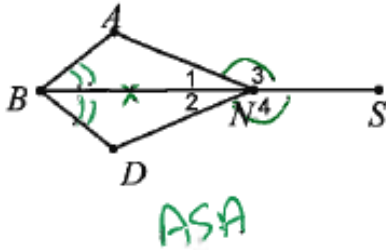


SAS

- | S | R. |
|--|--|
| ① $\overline{BD} \cong \overline{BA}$ (side)
\overline{BC} bisects $\angle ABD$ | ① Given |
| ② $\angle DBC \cong \angle ABC$ (Angle) | ② \angle bisector \div \angle into 2 \cong \angle 's |
| ③ $\overline{BC} \cong \overline{BC}$ (side) | ③ Reflexive. |
| ④ $\triangle BDC \cong \triangle BAC$ | ④ SAS |

3. Given: \overline{BNS}
 $\angle 3 \cong \angle 4$ (not in Δ so use supps.)
 $\angle ABN \cong \angle DBN$

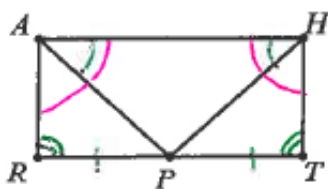
Prove: $\triangle BAN \cong \triangle BDN$



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 $\triangle BAN \cong \triangle BDN$	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: $\triangle RAP \cong \triangle THP$



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 $m\angle RAP + m\angle PHA = m\angle THP + m\angle PAH$	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 $\triangle RAP \cong \triangle THP$	⑧ AAS