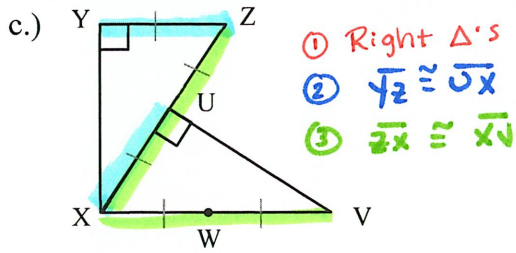
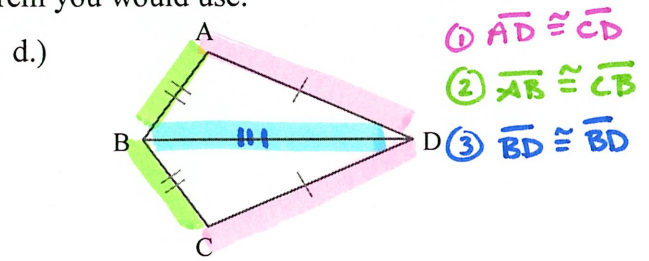


Example #5: Decide whether enough information is given to prove that the triangles are congruent. If there is enough information, state the congruence postulate or theorem you would use.



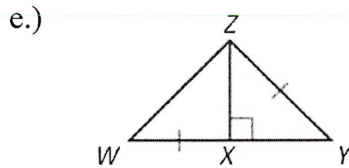
- ① Right Δ 's
- ② $\overline{YU} \cong \overline{UX}$
- ③ $\overline{XZ} \cong \overline{XV}$

$\Delta YZX \cong \Delta UXV$; HL

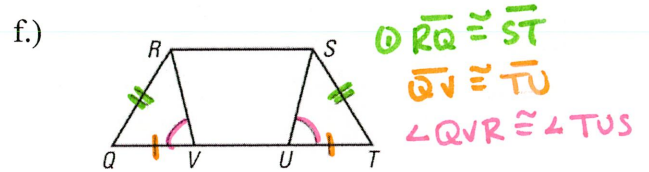


- ① $\overline{AD} \cong \overline{CD}$
- ② $\overline{AB} \cong \overline{CB}$
- ③ $\overline{BD} \cong \overline{BD}$

$\Delta ABD \cong \Delta CBD$; SSS

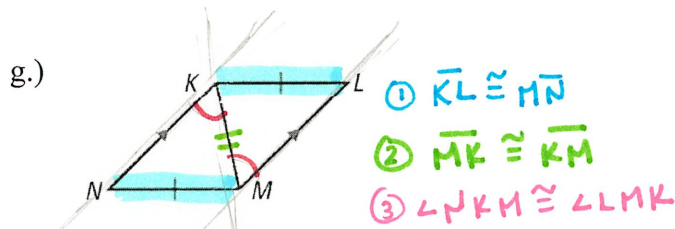


Not Enough Information



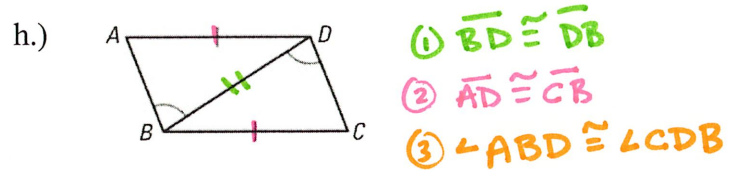
- ① $\overline{RQ} \cong \overline{ST}$
- ② $\overline{QV} \cong \overline{TU}$
- ③ $\angle QVR \cong \angle TUS$

$\angle QVR$ and $\angle TUS$ are not the included angle \rightarrow SSA is NOT a valid method



- ① $\overline{KL} \cong \overline{MN}$
- ② $\overline{MK} \cong \overline{KM}$
- ③ $\angle NKM \cong \angle LMK$

$\angle NKM$ and $\angle LMK$ are not included angles \rightarrow SSA is not a valid method



- ① $\overline{BD} \cong \overline{DB}$
- ② $\overline{AD} \cong \overline{CB}$
- ③ $\angle ABD \cong \angle CDB$

$\angle ABD$ and $\angle CDB$ are not included angles \rightarrow SSA is not a valid method

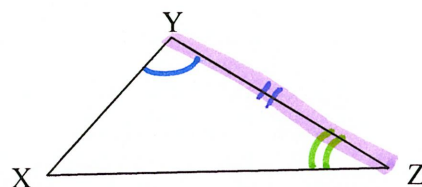
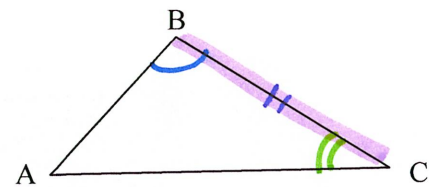
Chapter 4.5: Prove Triangles Congruent by ASA and AAS

Angle-Side-Angle (ASA) Congruent Postulate (Postulate 21):

If two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle, then the two triangles are Congruent.

- If $A: \angle B \cong \angle Y$
 $S: \overline{BC} \cong \overline{YZ}$
 $A: \angle C \cong \angle Z$

Then $\Delta ABC \cong \Delta XYZ$
 Congruence Statement



Angle-Angle-Side (AAS) Congruent Theorem (Theorem 4.6):

If two angles and a non-included side of one triangle are congruent to two angles and the corresponding non-included side of a second triangle, then the two triangles are Congruent.

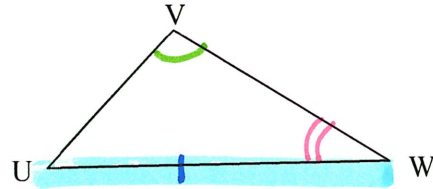
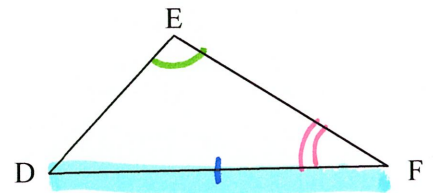
If A: $\angle E \cong \angle V$

A: $\angle F \cong \angle W$

S: $\overline{DF} \cong \overline{JW}$

Then $\triangle DEF \cong \triangle VWJ$

Congruence statement



Example #1: Can the triangles be proven congruent with the information given in the diagram?
If so, state the postulate or theorem you would use.

a.)

- ① $\angle A \cong \angle C$
- ② $\angle ABD \cong \angle CBD$
- ③ $\overline{BD} \cong \overline{BD}$

 $\triangle ABD \cong \triangle CBD$; **AAS**

b.)

$\angle Z$ and $\angle L$ are not included
SSA is not a valid method

c.)

- ① $\angle QRP \cong \angle SPR$
- ② $\overline{RP} \cong \overline{PR}$
- ③ $\angle SRP \cong \angle QPR$

 $\triangle RPQ \cong \triangle PRS$; **ASA**

d.)

- ① $\angle S \cong \angle V$
- ② $\angle STW \cong \angle VWT$
- ③ $\overline{TW} \cong \overline{WT}$

 $\triangle STW \cong \triangle VWT$; **AAS**

e.)

AAA is not a valid method

f.)

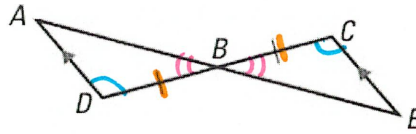
- ① $\angle L \cong \angle P$
- ② $\overline{LN} \cong \overline{PN}$
- ③ $\angle LNM \cong \angle PNO$

 $\triangle LNM \cong \triangle PNO$; **ASA**

Example #2: Prove.

Given: $\overline{BD} \cong \overline{BC}$, $\overline{AD} \parallel \overline{BC}$

Prove: $\triangle ABD \cong \triangle EBC$

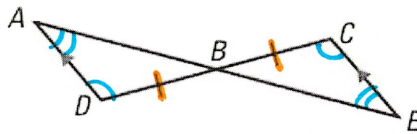


Statement	Reason
1. S: $\overline{BD} \cong \overline{BC}$	1. Given
2. $\overline{AD} \parallel \overline{BC}$	2. Given
3. A: $\angle D \cong \angle C$	3. Alternate Interior Angles
4. A: $\angle ABD \cong \angle EBC$	4. Vertical Angles
5. $\triangle ABD \cong \triangle EBC$	5. ASA

Example #2: Prove.

Given: $\overline{BD} \cong \overline{BC}$, $\overline{AD} \parallel \overline{BC}$

Prove: $\triangle ABD \cong \triangle EBC$

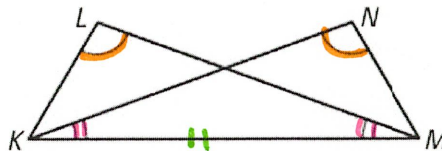


Statement	Reason
1. S: $\overline{BD} \cong \overline{BC}$	1. Given
2. $\overline{AD} \parallel \overline{BC}$	2. Given
3. A: $\angle D \cong \angle C$	3. Alternate Interior Angles
4. A: $\angle A \cong \angle E$	4. Alternate Interior Angles
5. $\triangle ABD \cong \triangle EBC$	5. AAS

Example #3: Prove.

Given: $\angle NKM \cong \angle LMK$, $\angle L \cong \angle N$

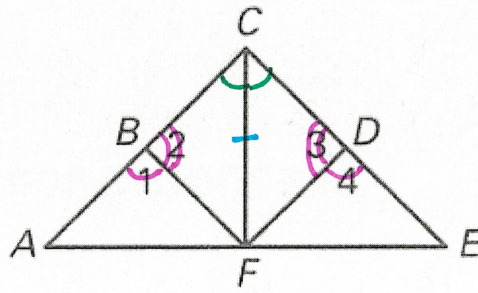
Prove: $\triangle NMK \cong \triangle LKM$



Statement	Reason
1. A: $\angle L \cong \angle N$	1. Given
2. A: $\angle NKM \cong \angle LMK$	2. Given
3. S: $\overline{KM} \cong \overline{MK}$	3. Reflexive Property
4. $\triangle LKM \cong \triangle NMK$	4. AAS
5.	5.

Example #4: Prove.

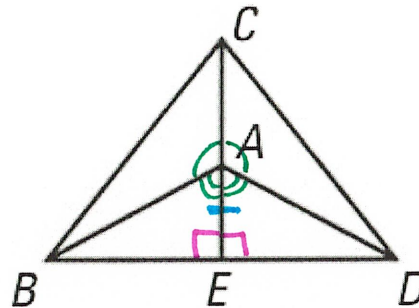
Given: $\angle 1 \cong \angle 4$
 \overline{CF} bisects $\angle ACE$
Prove: $\triangle CBF \cong \triangle CDF$



Statement	Reason
1. $\angle 1 \cong \angle 4$	1. Given
2. $\angle 1$ and $\angle 2$ are supplementary angles $\angle 4$ and $\angle 3$ are supplementary angles	2. Def ⁿ of Supplementary Angles
3. A: $\angle 2 \cong \angle 3$	3. Congruent Supplements Th ^m
4. \overline{CF} bisects $\angle ACE$	4. Given
5. A: $\angle BCF \cong \angle DCF$	5. Def ⁿ of an angle bisector
6. S: $\overline{CF} \cong \overline{CF}$	6. Reflexive Property
7. $\triangle CBF \cong \triangle CDF$	7. AAS

Example #5: Prove.

Given: $\overline{CE} \perp \overline{BD}$
 $\angle CAB \cong \angle CAD$
Prove: $\triangle ABE \cong \triangle ADE$



Statement	Reason
1. $\overline{CE} \perp \overline{BD}$	1. Given
2. $\angle AEB = 90^\circ$, $\angle AED = 90^\circ$	2. Def ⁿ of Perpendicular Lines
3. A: $\angle AEB \cong \angle AED$	3. Transitive Prop. / All 90° \angle 's are \cong
4. $\angle CAB \cong \angle CAD$	4. Given
5. $\angle CAB$ and $\angle EAB$ are supplementary angles $\angle CAD$ and $\angle EAD$ are supplementary angles	5. Def ⁿ of supplementary Angles
6. A: $\angle EAB \cong \angle EAD$	6. Congruent Supplements Th ^m
7. S: $\overline{AE} \cong \overline{AE}$	7. Reflexive Property
8. $\triangle ABE \cong \triangle ADE$	8. ASA