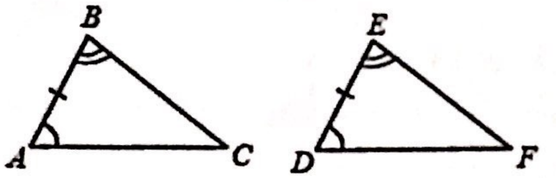
TRIANGLE CONGRUENCE: **ASA & AAS**

ANGLE-SIDE-ANGLE (ASA)

If two angles and the included side of one triangle are congruent to two angles and an included side of another triangle, then the triangles are congruent.



If $\angle A \cong \angle D$ (Angle)

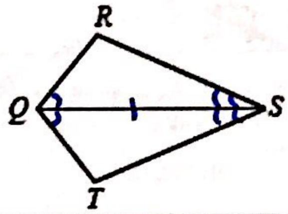
$\overline{AB} \cong \overline{DE}$ (Side)

$\angle B \cong \angle E$ (Angle)

Then, $\Delta ABC \cong \Delta DEF$

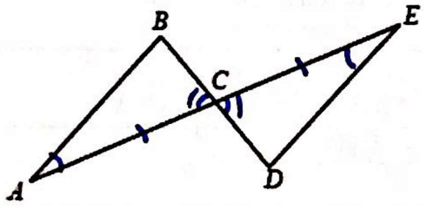
INCLUDED MEANS THE SIDE BETWEEN THE ANGLES!!

SAMPLE ASA PROOFS:



1. **Given:** $\overline{SQ}$ *bisects* $\angle RQT$ *and* $\angle RST$
   Prove: $\Delta QRS \cong \Delta QTS$

Statements	Reasons
1. $\overline{SQ}$ bisects $\angle RQT$ and $\angle RST$	given
2. $\angle RQS \cong \angle TQS$	def. of bisect
3. $\angle RSQ \cong \angle TSQ$	def. of bisect
4. $\overline{QS} \cong \overline{QS}$	reflexive
5. $\Delta QRS \cong \Delta QTS$	ASA



2. **Given:** $\angle BAC \cong \angle DEC$, C *is the midpoint of* $\overline{AE}$
   Prove: $\Delta ABC \cong \Delta EDC$

Statements	Reasons
1. $\angle BAC \cong \angle DEC$	given
2. C is the midpoint of $\overline{AE}$	Given
3. $\overline{AC} \cong \overline{EC}$	def. midpoint
4. $\angle BCA \cong \angle DCE$	Vertical Angles
5. $\Delta ABC \cong \Delta EDC$	ASA

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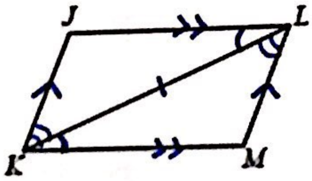
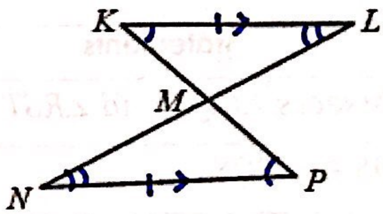
3. **Given:** $\overline{JK} \parallel \overline{LM}, \overline{JL} \parallel \overline{KM}$
Prove: $\Delta JKL \cong \Delta MLK$



Statements	Reasons
1. $\overline{JK} \parallel \overline{LM}$	given
2. $\angle JKL \cong \angle MLK$	Alternate Interior Angles
3. $\overline{JL} \parallel \overline{KM}$	Given
4. $\angle JLK \cong \angle MKL$	alt. int. angles
5. $\overline{KL} \cong \overline{KL}$	Reflexive Property
6. $\Delta JKL \cong \Delta MLK$	ASA

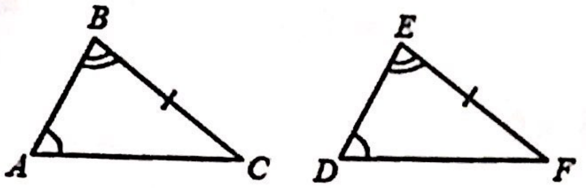


4. **Given:** $\overline{KL} \parallel \overline{NP}, \overline{KL} \cong \overline{NP}$
Prove: $\Delta KML \cong \Delta PMN$

Statements	Reasons
1. $\overline{KL} \parallel \overline{NP}$	given
2. $\angle LKM \cong \angle NPM$	alt. int angles
3. $\angle KLM \cong \angle PNM$	Alternate Interior Angles
4. $\overline{KL} \cong \overline{NP}$	given
5. $\Delta KML \cong \Delta PMN$	ASA

ANGLE-ANGLE-SIDE (AAS)

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



If $\angle A \cong \angle D$ (Angle)

$\angle B \cong \angle E$ (Angle)

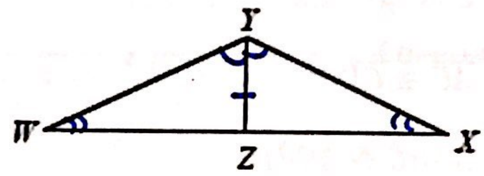
$\overline{BC} \cong \overline{EF}$ (Side)

Then, $\triangle ABC \cong \triangle DEF$

NON-INCLUDED MEANS THE SIDE OPPOSITE THE ANGLES!!

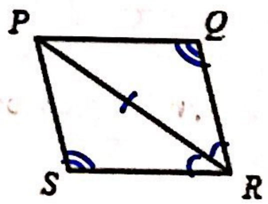
SAMPLE AAS PROOFS:

1. **Given:** $\overline{YZ}$ *bisects* $\angle WYX, \angle YWZ \cong \angle YXZ$
   Prove: $\Delta WYZ \cong \Delta XYZ$



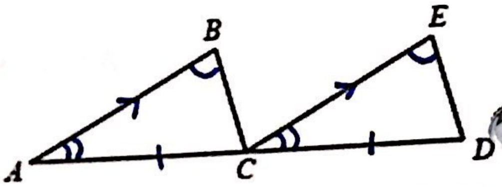
Statements	Reasons
1. $\overline{YZ}$ *bisects* $\angle WYX$	given
2. $\angle WYZ \cong \angle XYZ$	def. of bisect
3. $\angle YWZ \cong \angle YXZ$	given
4. $\overline{YZ} \cong \overline{YZ}$	reflexive
5. $\Delta WYZ \cong \Delta XYZ$	AAS

2. **Given:** $\overline{PR}$ *bisects* $\angle QRS, \angle PSR \cong \angle PQR$
   Prove: $\Delta PSR \cong \Delta PQR$



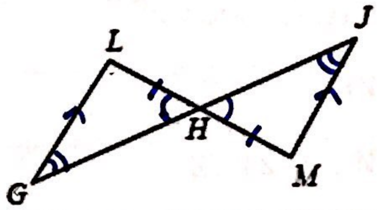
Statements	Reasons
1. $\overline{PR}$ *bisects* $\angle QRS$	given
2. $\angle PRQ \cong \angle PRS$	Definition of Angle Bisector
3. $\angle PSR \cong \angle PQR$	given
4. $\overline{PR} \cong \overline{PR}$	Reflexive Property of Congruence
5. $\Delta PSR \cong \Delta PQR$	AAS

3. **Given:** $\angle ABC \cong \angle CED, \overline{AB} \parallel \overline{CE},$ C *is the midpoint of* $\overline{AD}$
Prove: $\Delta ABC \cong \Delta CED$



Statements	Reasons
1. $\angle ABC \cong \angle CED$	given
2. $\overline{AB} \parallel \overline{CE}$	given
3. $\angle BAC \cong \angle ECD$	corresponding angles
4. C *is the midpoint of* $\overline{AD}$	given
5. $\overline{AC} \cong \overline{CD}$	def. of midpoint
6. $\Delta ABC \cong \Delta CED$	AAS

4. **Given:** $\overline{LG} \parallel \overline{JM},$ H *is the midpoint of* $\overline{LM}$
Prove: $\Delta LGH \cong \Delta MJH$



Statements	Reasons
1. $\overline{LG} \parallel \overline{JM}$	given
2. $\angle G \cong \angle J$	Alternate Interior Angles
3. H is the mp of $\overline{LM}$	Given
4. $\overline{LH} \cong \overline{HM}$	def of midpoint
* 5. $\angle GHL \cong \angle MHL$	vertical angles thm
6. $\Delta LGH \cong \Delta MJH$	AAS