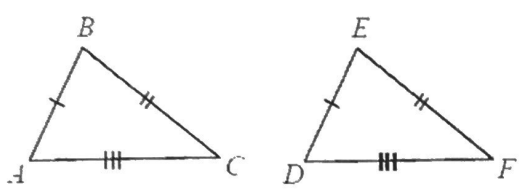


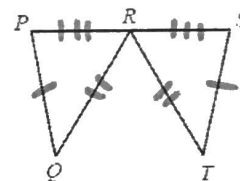
# TRIANGLE CONGRUENCE: SSS & SAS

If all corresponding angles and sides of two triangles are congruent, then the triangles are congruent. However, you can prove triangles are congruent using fewer parts.

<b>SIDE-SIDE-SIDE (SSS)</b>	
If three sides of one triangle are congruent to three sides of another triangle, then the triangles are congruent.	
	If $\overline{AB} \cong \overline{DE}$ (Side) $\overline{BC} \cong \overline{EF}$ (Side) $\overline{AC} \cong \overline{DF}$ (Side) then, $\triangle ABC \cong \triangle DEF$ by SSS

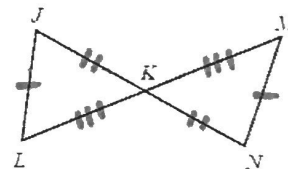
## SAMPLE SSS PROOFS:

- ① **Given:**  $\overline{PQ} \cong \overline{ST}$ ,  $\overline{QR} \cong \overline{RT}$ ,  $R$  is the midpoint of  $\overline{PS}$   
**Prove:**  $\triangle PQR \cong \triangle STR$



Statements	Reasons
1. $\overline{PQ} \cong \overline{ST}$	1. Given
2. $\overline{QR} \cong \overline{RT}$	2. Given
3. $R$ is the midpoint of $\overline{PS}$	3. Given
4. $\overline{PR} \cong \overline{RS}$	4. Def. of midpoint
5. $\triangle PQR \cong \triangle STR$	5. SSS

- ② **Given:**  $\overline{JL} \cong \overline{MN}$ ,  $K$  is the midpoint of  $\overline{JN}$  and  $\overline{LM}$   
**Prove:**  $\triangle JKL \cong \triangle NKM$

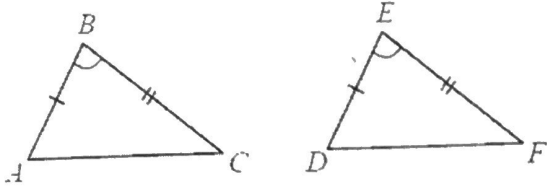


Statements	Reasons
1. $\overline{JL} \cong \overline{MN}$	1. Given
2. $K$ is the midpoint of $\overline{JN}$ and $\overline{LM}$	2. Given
3. $\overline{JK} \cong \overline{KN}$	3. Def. of midpoint
4. $\overline{LK} \cong \overline{KM}$	4. Def. of midpoint
5. $\triangle JKL \cong \triangle NKM$	5. SSS

### 3.8 Guided Notes (SSS and SAS Proofs)

## SIDE-ANGLE-SIDE (SAS)

If two sides and the included angle of one triangle is congruent to two sides and the included angle of another triangle, then the two triangles are congruent.

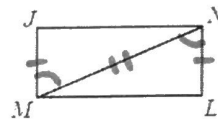


If  $\overline{AB} \cong \overline{DE}$  (Side)  
 $\angle B \cong \angle E$  (Angle)  
 $\overline{BC} \cong \overline{EF}$  (Side)  
 then,  $\triangle ABC \cong \triangle DEF$  by SAS

**INCLUDED MEANS THE ANGLE BETWEEN THE SIDES!!**

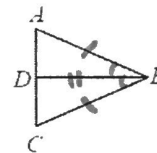
### SAMPLE SAS PROOFS:

- 4 Given:  $\overline{JM} \cong \overline{NL}$ ,  $\angle JMN \cong \angle LNM$   
 Prove:  $\triangle JMN \cong \triangle LNM$



Statements	Reasons
1. $\overline{JM} \cong \overline{NL}$	1. Given
2. $\angle JMN \cong \angle LNM$	2. Given
3. $\overline{MN} \cong \overline{MN}$	3. Reflexive Property
4. $\triangle JMN \cong \triangle LNM$	4. SAS

- 5 Given:  $\overline{AB} \cong \overline{BC}$ ,  $\overline{BD}$  bisects  $\angle ABC$   
 Prove:  $\triangle ABD \cong \triangle CBD$



Statements	Reasons
1. $\overline{AB} \cong \overline{BC}$	1. Given
2. $\overline{BD}$ bisects $\angle ABC$	2. Given
3. $\angle ABD \cong \angle CBD$	3. Def. of bisector
4. $\overline{BD} \cong \overline{BD}$	4. Reflexive Property
5. $\triangle ABD \cong \triangle CBD$	5. SAS

**Reasons Sides are Congruent**

- It's Given
- Definition of Midpoint (A midpoint will create two congruent sides)
- Reflexive Property (A side is congruent to itself)

**Reasons Angles are Congruent**

- It's Given
  - Vertical Angles
  - Alternate Interior Angles
  - Alternate Exterior Angles
  - Corresponding Angles
  - Definition of Angle Bisector
- (These four will create two congruent angles)  
 (These four will create two congruent angles)