

Objectives: Apply SSS and SAS to construct triangles and solve problems. Prove triangles congruent using SSS and SAS.

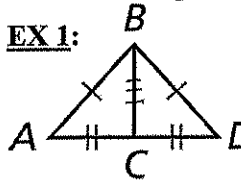
- In 4-4, we learned to prove triangles congruent by showing that all 3 ^{corr.} sides and all 3 ^{corr.} angles were \cong . Today we will learn 2 shortcuts to prove triangles are congruent.

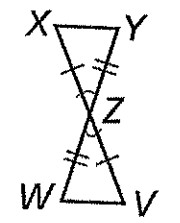
1) Proving Triangles Congruent:

Theorem/ Postulate	Hypothesis	Conclusion
SSS	If 3 sides of one triangle are \cong to 3 sides of another triangle, then the triangles are \cong then $\triangle ABC \cong \triangle FDE$
SAS ↑ in between	If 2 sides and the included angle of 1 triangle are congruent to 2 sides and the included angle of another triangle, then the triangles are \cong then $\triangle ABC \cong \triangle EFD$

► **Included Angle:** an angle formed by 2 adjacent sides of a polygon. (included means in-between)

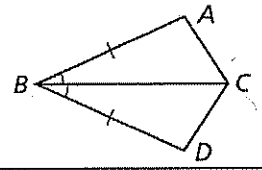
Are the triangles congruent? How?

EX 1:  yes!
SSS

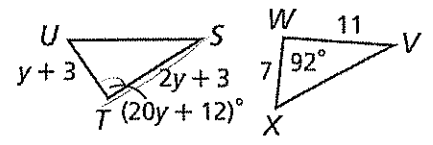
EX 2:  yes!
SAS

EX 3: What's the 3rd piece needed to prove $\triangle BAC \cong \triangle BDC$?

- 3rd side
- What property allows you to do this? reflexive
 - What theorem proves $\triangle BAC \cong \triangle BDC$? SAS



EX 4: What value of y makes $\triangle STU \cong \triangle VWX$?



$$y+3 = 7$$

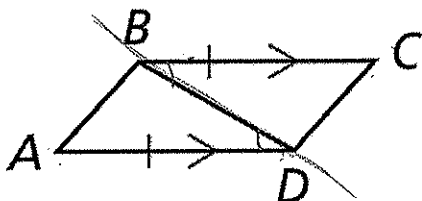
$$\quad \quad -3 \quad -3$$

$$\hline y = 4 \quad y = 4$$

Complete the proofs.

EX 5: Given: $\overline{BC} \parallel \overline{AD}$, $\overline{BC} \cong \overline{AD}$

Prove: $\triangle ABD \cong \triangle CDB$

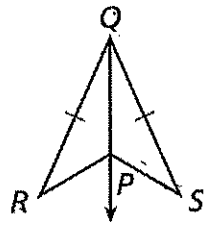


Statements	Reasons
1. $\overline{BC} \parallel \overline{AD}$	1. Given
2. $\angle B \cong \angle D$	2. alt. int. \angle 's
3. $\overline{BC} \cong \overline{AD}$	3. Given
4. $\overline{BD} \cong \overline{BD}$	4. Reflexive
5. $\triangle ABD \cong \triangle CDB$	5. SAS

EX 6: Given: $\overline{QR} \cong \overline{QS}$,

\overline{QP} bisects $\angle RQS$

Prove: $\triangle RQP \cong \triangle SQP$



Statements	Reasons
1. $\overline{QR} \cong \overline{QS}$	1. Given
2. \overline{QP} bisects $\angle RQS$	2. Given
3. $\angle R \cong \angle S$	3. Def. of bisector
4. $\overline{QP} \cong \overline{QP}$	4. Reflexive
5. $\triangle RQP \cong \triangle SQP$	5. $\cong \Delta$ Th.