

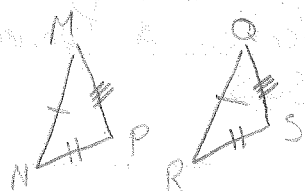
4.3: Proving Triangles are Congruent: SSS, SAS

Objective: Prove that triangles are congruent using the SSS and SAS Congruence Postulates

Warm-up: Pencil Activity, SSS, SAS

Postulate 19 Side-Side-Side (SSS) Congruence Postulate

If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent



If side $\overline{MN} \cong \overline{QR}$,
side $\overline{NP} \cong \overline{RS}$,
and side $\overline{PM} \cong \overline{SQ}$, then $\triangle MNP \cong \triangle QRS$

Proof using Postulate 19

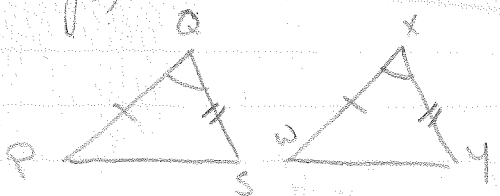


Given ABCD is a rectangle
Prove: $\triangle ABD \cong \triangle CDB$

Statement	Reason
1) ABCD is a rectangle	1) Given
2) $\overline{AB} \cong \overline{DC}$, $\overline{AD} \cong \overline{BC}$	2) Def of rectangle
3) $\overline{BD} \cong \overline{BD}$	3) Reflexive P.O.C
4) $\triangle ABD \cong \triangle CDB$	4) SSS

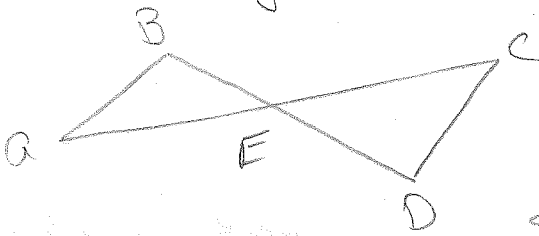
Postulate 20 Side-Angle-Side Congruence Postulate

If two sides and the included angle (angle between) of one triangle are congruent to two sides and the included angle of another triangle, then the two triangles are congruent



If side $\overline{PQ} \cong \overline{WX}$,
Angle $\angle Q \cong \angle X$,
and side $\overline{QS} \cong \overline{XY}$, then $\triangle PQS \cong \triangle WXY$

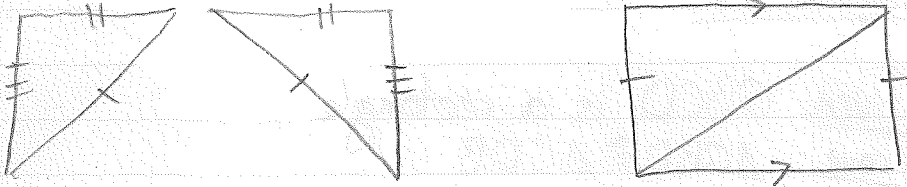
Proof using SAS Postulate



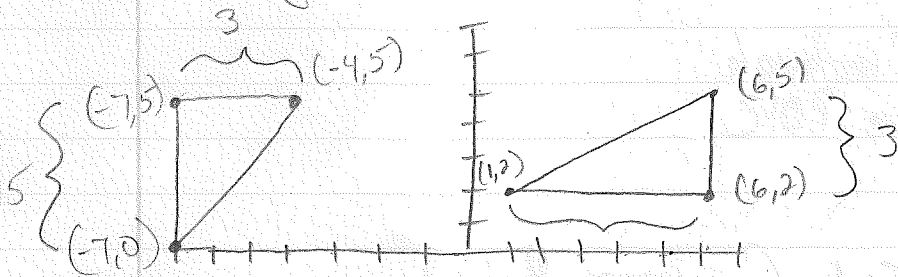
Given E is the midpoint of \overline{AC} and \overline{BD}
Prove; $\triangle ABE \cong \triangle CDE$

Statement	Reason
1) E is the midpoint of \overline{AC} , \overline{BD}	1) Given
2) $\overline{AE} \cong \overline{EC}$, $\overline{BE} \cong \overline{ED}$	2) Def of midpoint
3) $\angle AEB \cong \angle DEC$	3) Vertical \angle Theorem
4) $\triangle ABE \cong \triangle CDE$	4) SAS

Deciding which postulate to use



Using a coordinate system and SSS



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(-7 - (-4))^2 + (0 - 5)^2}$$

$$\sqrt{(-3)^2 + (-5)^2}$$

$$\sqrt{9 + 25}$$

$$\sqrt{34}$$

$$\sqrt{(1 - 6)^2 + (2 - 5)^2}$$

$$\sqrt{(-5)^2 + (-3)^2}$$

$$\sqrt{25 + 9}$$

$$\sqrt{34}$$

Closure: What does SSS state?
 SAS?

Homework - 4.3B