

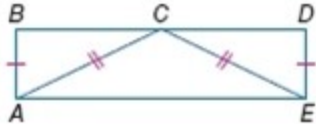
4-4 Proving Triangles Congruent-SSS, SAS

PROOF Write the specified type of proof.

6. two-column proof

Given: $\overline{AB} \cong \overline{ED}$, $\overline{CA} \cong \overline{CE}$;
 \overline{AC} bisects \overline{BD} .

Prove: $\triangle ABC \cong \triangle EDC$



ANSWER:

Proof:

Statements (Reasons)

- $\overline{AB} \cong \overline{ED}$, $\overline{CA} \cong \overline{CE}$, and \overline{AC} bisects \overline{BD} (Given)
- C is the midpoint of \overline{BD} (Def. of Segment Bisectors)
- $\overline{BC} \cong \overline{CD}$ (Midpoint Thm.)
- $\triangle ABC \cong \triangle EDC$ (SSS)

CCSS SENSE-MAKING Determine whether $\triangle MNO \cong \triangle QRS$. Explain.

8. $M(2, 5)$, $N(5, 2)$, $O(1, 1)$, $Q(-4, 4)$, $R(-7, 1)$, $S(-3, 0)$

ANSWER:

$MN = \sqrt{18}$, $NO = \sqrt{17}$, $MO = \sqrt{17}$, $QR = \sqrt{18}$, $RS = \sqrt{17}$, and $QS = \sqrt{17}$. Each pair of corresponding sides has the same measure so they are congruent. $\triangle MNO \cong \triangle QRS$ by SSS.

10. $M(0, -3)$, $N(1, 4)$, $O(3, 1)$, $Q(4, -1)$, $R(6, 1)$, $S(9, -1)$

ANSWER:

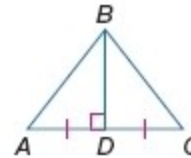
$MN = \sqrt{50}$, $NO = \sqrt{13}$, $MO = 5$, $QR = \sqrt{8}$, $RS = \sqrt{13}$, and $QS = 5$. The corresponding sides are not congruent, so the triangles are not congruent

PROOF Write the specified type of proof.

12. two-column proof

Given: $\overline{BD} \perp \overline{AC}$,
 \overline{BD} bisects \overline{AC} .

Prove: $\triangle ABD \cong \triangle CBD$



ANSWER:

Proof: Statements (Reasons)

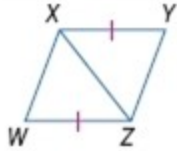
- $\overline{BD} \perp \overline{AC}$, \overline{BD} bisects \overline{AC} . (Given)
- $\angle BDA$ and $\angle BDC$ are right angles. (Def. of \perp)
- $\angle BDA \cong \angle BDC$ (all right angles are \cong)
- $\overline{AD} \cong \overline{DC}$ (Def. of bisects)
- $\overline{BD} \cong \overline{BD}$ (Ref. Prop.)
- $\triangle ABD \cong \triangle CBD$ (SAS)

4-4 Proving Triangles Congruent-SSS, SAS

PROOF Write a two-column proof.

24. **Given:** $\overline{YX} \cong \overline{WZ}$, $\overline{YX} \parallel \overline{ZW}$

Prove: $\triangle YXZ \cong \triangle WZX$



ANSWER:

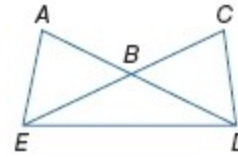
Proof:

Statements (Reasons)

1. $\overline{YX} \cong \overline{WZ}$, $\overline{YX} \parallel \overline{ZW}$ (Given)
2. $\angle YXZ \cong \angle WZX$ (Alt. In/t. \angle s)
3. $\overline{XZ} \cong \overline{ZX}$ (Reflex. Prop.)
4. $\triangle YXZ \cong \triangle WZX$ (SAS)

25. **Given:** $\triangle EAB \cong \triangle DCB$

Prove: $\triangle EAD \cong \triangle DCE$



ANSWER:

Proof:

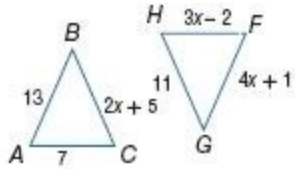
Statements (Reasons)

1. $\triangle EAB \cong \triangle DCB$ (Given)
2. $\overline{EA} \cong \overline{DC}$ (CPCTC)
3. $\overline{ED} \cong \overline{DE}$ (Reflex. Prop.)
4. $\overline{AB} \cong \overline{CB}$ (CPCTC)
5. $\overline{DB} \cong \overline{EB}$ (CPCTC)
6. $AB = CB$, $DB = EB$ (Def. \cong segments)
7. $AB + DB = CB + EB$ (Add. Prop. =)
8. $AD = AB + DB$, $CE = CB + EB$ (Segment addition)
9. $AD = CE$ (Subst. Prop. =)
10. $\overline{AD} \cong \overline{CE}$ (Def. \cong segments)
11. $\triangle EAD \cong \triangle DCE$ (SSS)

4-4 Proving Triangles Congruent-SSS, SAS

ALGEBRA Find the value of the variable that yields congruent triangles. Explain.

28. $\triangle ABC \cong \triangle FGH$



ANSWER:

$x = 3$; $\overline{AB} \cong \overline{FG}$, $\overline{AC} \cong \overline{FH}$, and $\overline{BC} \cong \overline{GH}$, so the Δ 's are congruent by SSS.