

4-7

Congruence in Overlapping Triangles

Content Standard

G.SRT.5 Use congruence . . . criteria to solve problems and prove relationships in geometric figures.

Objectives To identify congruent overlapping triangles
To prove two triangles congruent using other congruent triangles



Problem 1 Identifying Common Parts

What common angle do $\triangle ACD$ and $\triangle ECB$ share?

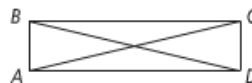
Separate and redraw $\triangle ACD$ and $\triangle ECB$.



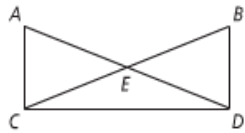
The common angle is $\angle C$.



- Got It?** 1. a. What is the common side in $\triangle ABD$ and $\triangle DCA$?
b. What is the common side in $\triangle ABD$ and $\triangle BAC$?

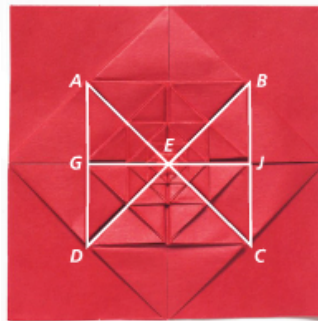


Got It? 2. Given: $\triangle ACD \cong \triangle BDC$
Prove: $\overline{CE} \cong \overline{DE}$



Given: In the origami design, E is the midpoint of \overline{AC} and \overline{DB} .

Prove: $\triangle GED \cong \triangle JEB$

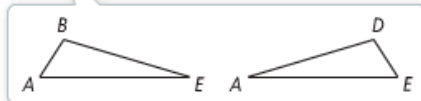
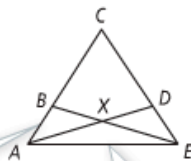




Problem 4 Separating Overlapping Triangles

Given: $\overline{CA} \cong \overline{CE}$, $\overline{BA} \cong \overline{DE}$

Prove: $\overline{BX} \cong \overline{DX}$



Statements

Reasons

- | | |
|--|--|
| 1) $\overline{BA} \cong \overline{DE}$ | 1) Given |
| 2) $\overline{CA} \cong \overline{CE}$ | 2) Given |
| 3) $\angle CAE \cong \angle CEA$ | 3) Base \angle of an isosceles \triangle are \cong . |
| 4) $\overline{AE} \cong \overline{AE}$ | 4) Reflexive Property of \cong |
| 5) $\triangle BAE \cong \triangle DEA$ | 5) SAS |
| 6) $\angle ABE \cong \angle EDA$ | 6) Corresp. parts of $\cong \triangle$ are \cong . |
| 7) $\angle BXA \cong \angle DXE$ | 7) Vertical angles are \cong . |
| 8) $\triangle BXA \cong \triangle DXE$ | 8) AAS |
| 9) $\overline{BX} \cong \overline{DX}$ | 9) Corresp. parts of $\cong \triangle$ are \cong . |

Got It? 4. **Given:** $\angle CAD \cong \angle EAD$, $\angle C \cong \angle E$
Prove: $\overline{BD} \cong \overline{FD}$

