

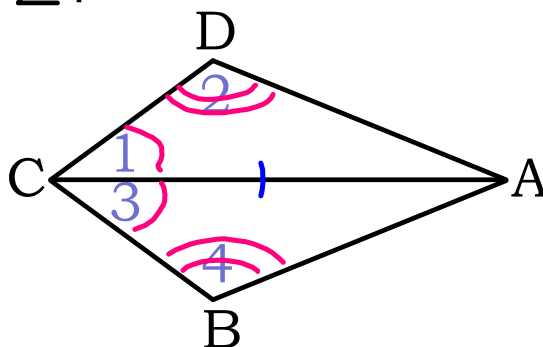
4.5 Using Congruent Triangles

Once you prove **two triangles**
are **congruent**
(using **SSS**, **SAS**, **ASA**, or **AAS**),
you can use **CPCTC** to show that
additional parts are congruent.

Example 1

Given: $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$

Prove: $\overline{CD} \cong \overline{CB}$



Statements

Reasons

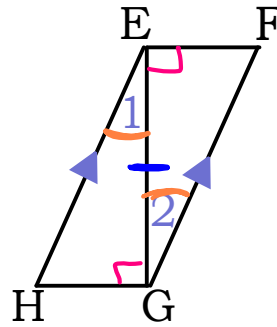
- ① $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$
- ② $\overline{CA} \cong \overline{CA}$
- ③ $\triangle CDA \cong \triangle CBA$
- ④ $\overline{CD} \cong \overline{CB}$

- ① Given
- ② reflexive prop.
- ③ AAS
- ④ CPCTC

Example 2

Given: $\overline{HG} \perp \overline{EG}$, $\overline{EF} \perp \overline{EG}$
 $\overline{HE} \parallel \overline{GF}$

Prove: $\overline{HE} \cong \overline{GF}$

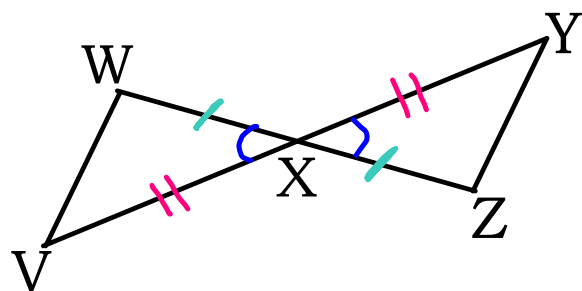


| Statements | Reasons |
|--|--------------------------------|
| ① $\overline{HG} \perp \overline{EG}$, $\overline{EF} \perp \overline{EG}$, $\overline{HE} \parallel \overline{GF}$ | ① given |
| ② $\angle HGE$ is a right \angle $\angle FEG$ is a right \angle | ② def of \perp |
| ③ $\angle HGE \cong \angle FEG$ | ③ all right \angle s \cong |
| ④ $\angle 1 \cong \angle 2$ | ④ alt int \angle thm. |
| ⑤ $\overline{EG} \cong \overline{EG}$ | ⑤ reflexive prop. |
| ⑥ $\triangle HGE \cong \triangle FEG$ | ⑥ ASA |
| ⑦ $\overline{HE} \cong \overline{GF}$ | ⑦ CPCTC |

Example 3

Given: X is the midpoint of \overline{VY}
 $\overline{WX} \cong \overline{ZX}$

Prove: $\angle V \cong \angle Y$



| Statements | Reasons |
|--|---------------------------|
| ① X is mdpt of \overline{VY} , $\overline{WX} \cong \overline{ZX}$ | ① given |
| ② $\overline{VX} \cong \overline{XY}$ | ② def of mdpt |
| ③ $\angle WXV \cong \angle ZXY$ | ③ vert \angle s \cong |
| ④ $\triangle WVX \cong \triangle ZYX$ | ④ SAS |
| ⑤ $\angle V \cong \angle Y$ | ⑤ CPCTC |