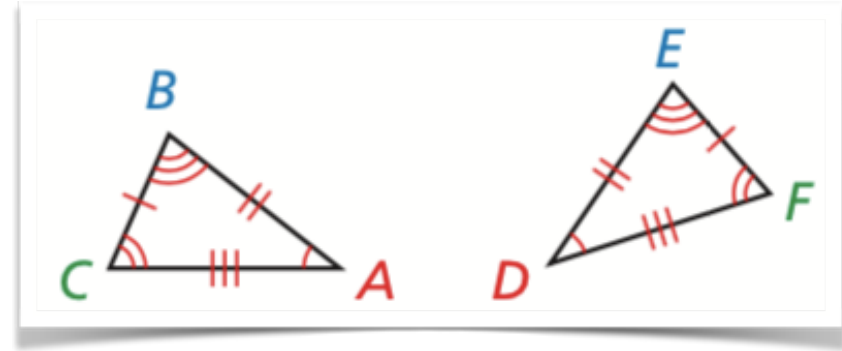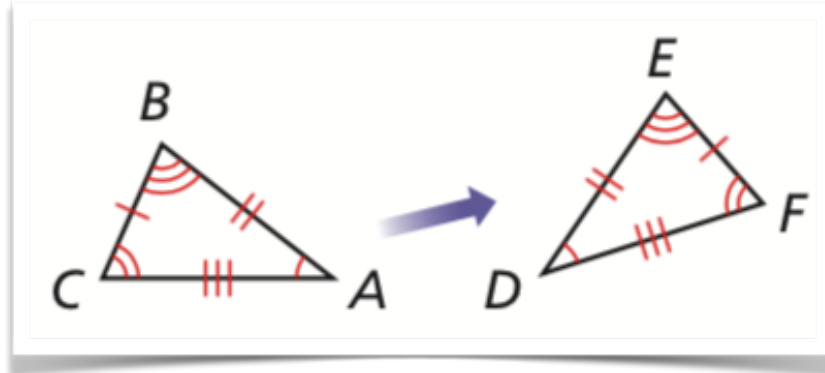# Chapter 5
Congruent Triangles
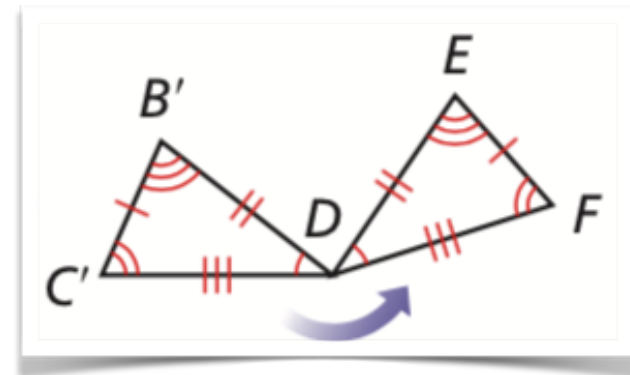
5.2 Congruent Polygons

Rigid Motion Proof
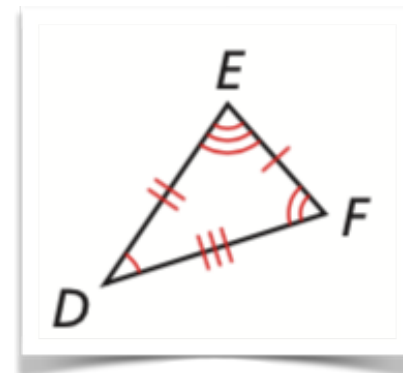
Proving two polygons are congruent
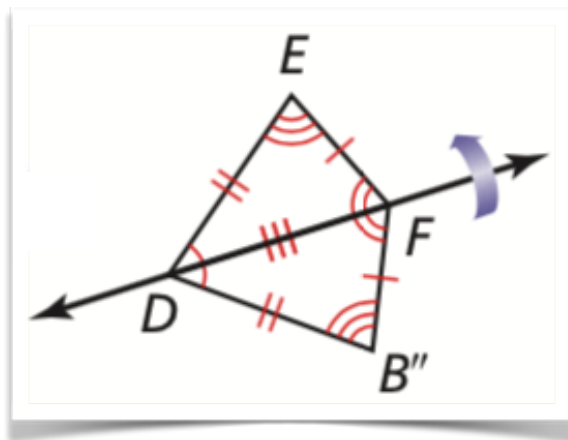
1) Translate

2) Rotate

3) Reflect

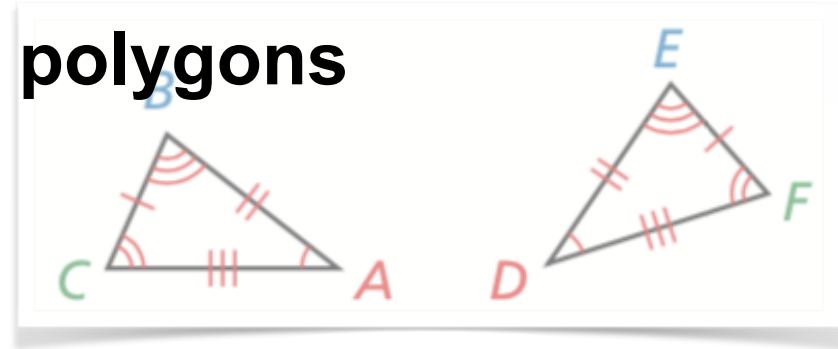If all their sides and angles map, they are congruent
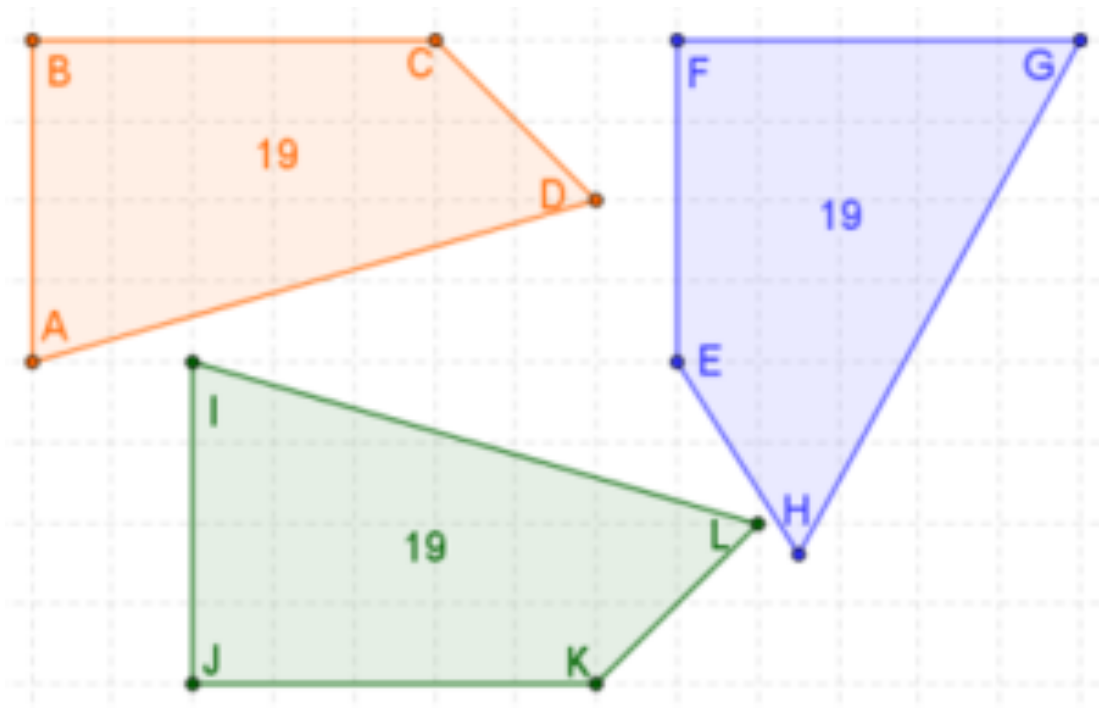
5.2 Congruent Polygons

Properties of congruent polygons

Two polygons are congruent when:

1. All corresponding <u>sides</u> are congruent.
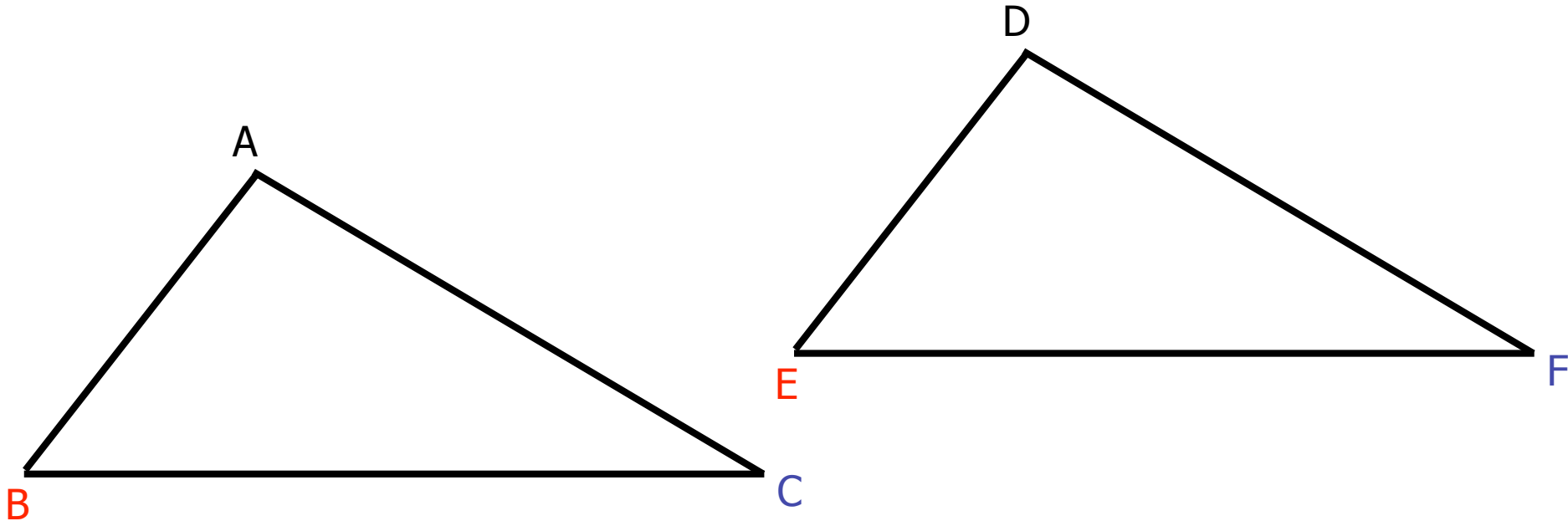2. All corresponding <u>angles</u> are congruent.

$$ABCD \cong ???$$

5.2 Congruent Polygons

- Suppose you are given that $\triangle ABC \cong \triangle DEF$

What do you automatically know?

$$\angle A \cong \angle D$$
$$\angle B \cong \angle E$$
$$\angle C \cong \angle F$$

$$\overline{AB} \cong \overline{DE}$$
$$\overline{BC} \cong \overline{EF}$$
$$\overline{AC} \cong \overline{DF}$$

5.2 Congruent Polygons

Corresponding parts of Congruent Triangles are Congruent

CPCTC

What do you automatically know?

$\angle A \cong \angle D$

$\angle B \cong \angle E$

$\angle C \cong \angle F$

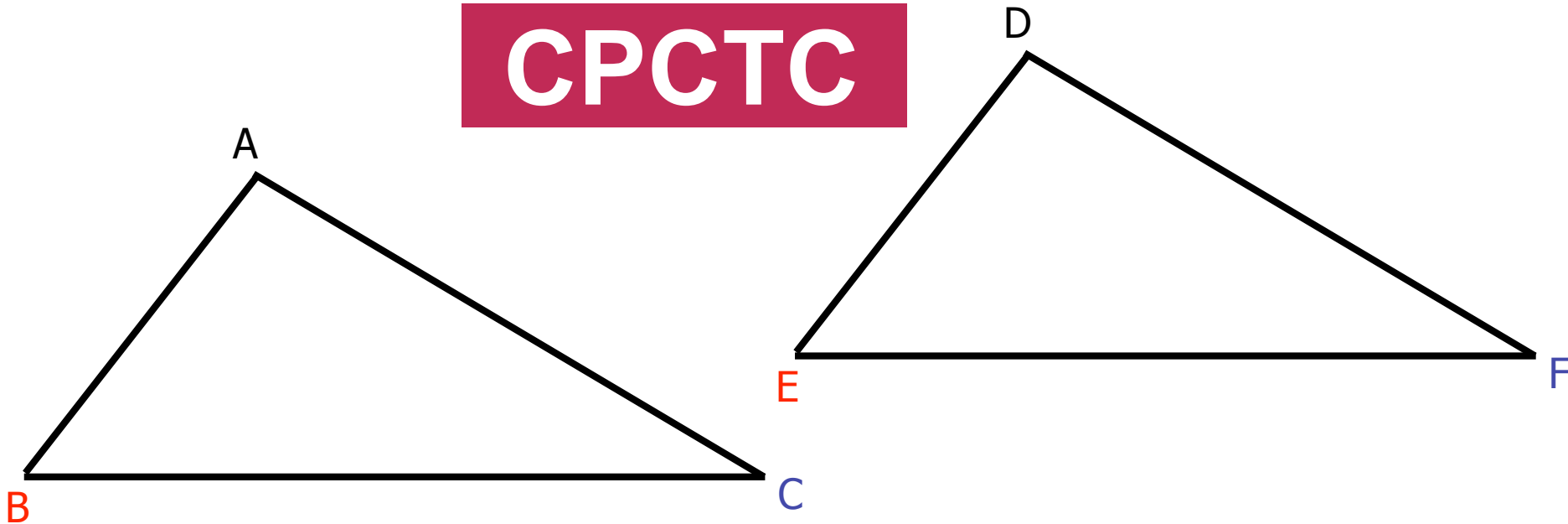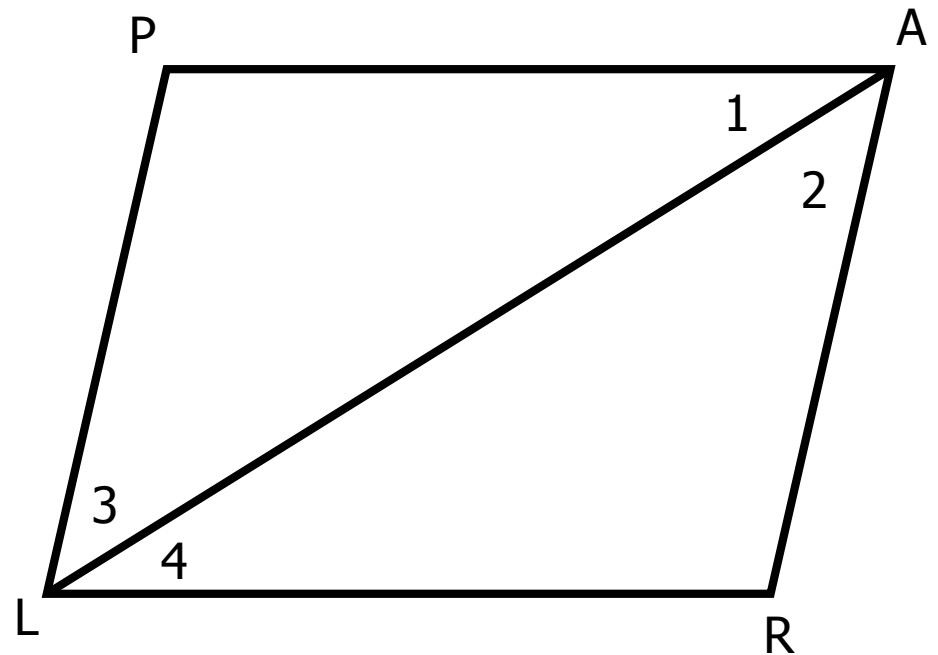$\overline{AB} \cong \overline{DE}$

$\overline{BC} \cong \overline{EF}$

$\overline{AC} \cong \overline{DF}$

5.2 Congruent Polygons

- The two triangles are congruent

a. $\triangle PAL \cong$ _____

b. $\overline{PA} \cong$ _____

c. $\angle 1 \cong$ _____ because _____

   Then $\overline{PA} \parallel$ _____ because _____
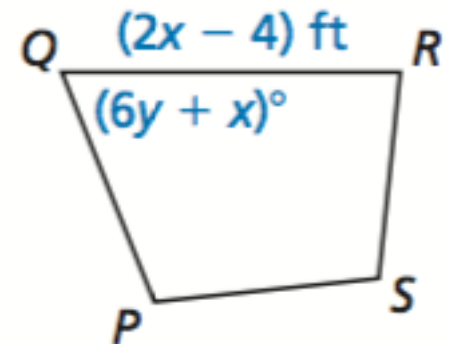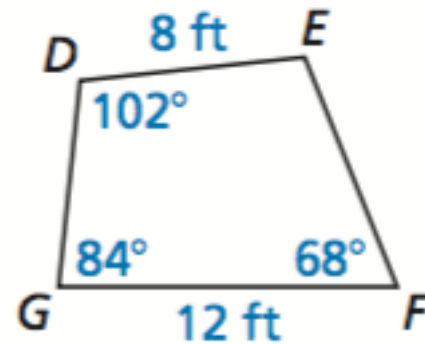
d. $\angle 2 \cong$ _____ because _____

   Then _____ $\parallel$ _____ because _____

5.2 Congruent Polygons

In the diagram, $DEFG \cong SPQR$.

a. Find the value of x.

b. Find the value of y.

5.2 Congruent Polygons

Properties of Triangle Congruence

Reflexive	For any triangle △ABC, △ABC ≅ △ABC.

Symmetric	If △ABC ≅ △DEF, then △DEF ≅ △ABC.

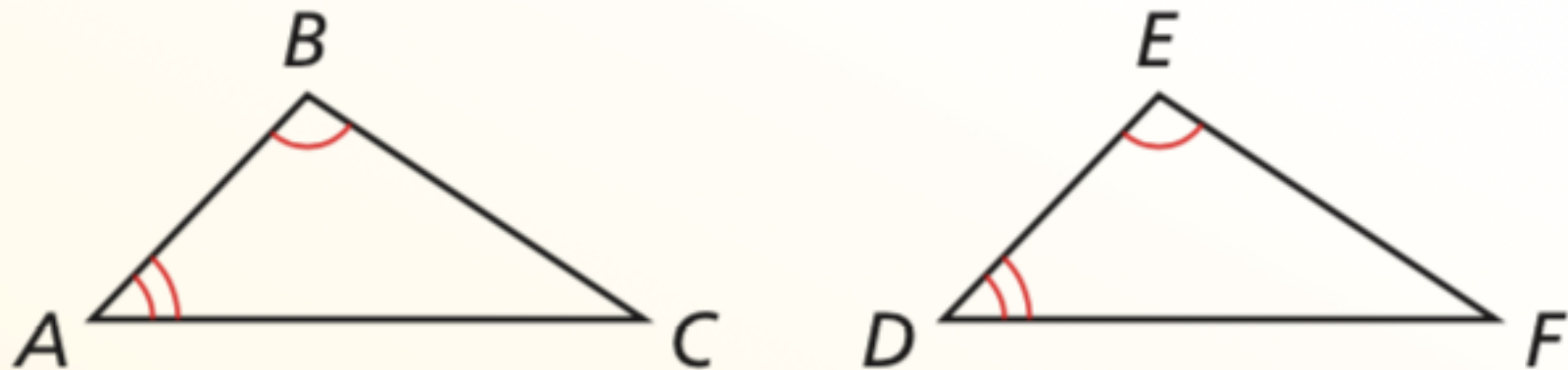|	
Transitive	If △ABC ≅ △DEF and △DEF ≅ △JKL, then △ABC ≅ △JKL.

5.2 Congruent Polygons

Theorem

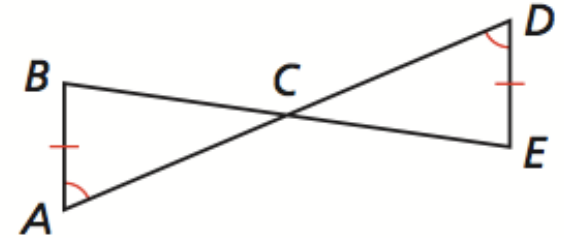| Third Angles Theorem	If two angles of one triangle are congruent to two angles of another triangle, then the third angles are also congruent.

If $\angle A \cong \angle D$ and $\angle B \cong \angle E$, then $\angle C \cong \angle F$.

5.2 Congruent Polygons

Prove:

Given $\overline{AD}$ bisects $\overline{BE}$, $\overline{BE}$ bisects $\overline{AD}$

Prove the two triangles congruent

Statements	Reasons