

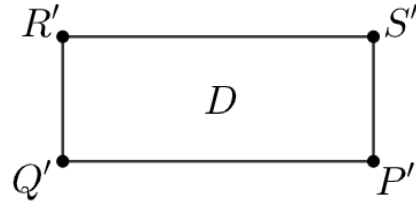
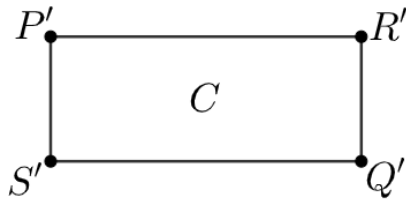
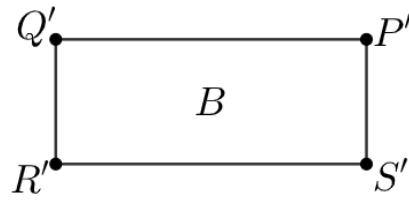
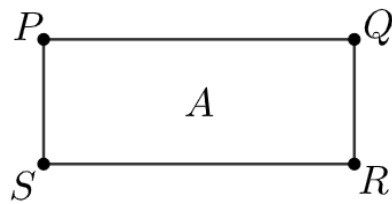
# Lesson 2.01

## Congruent Parts

Geometry GT

### Analyze

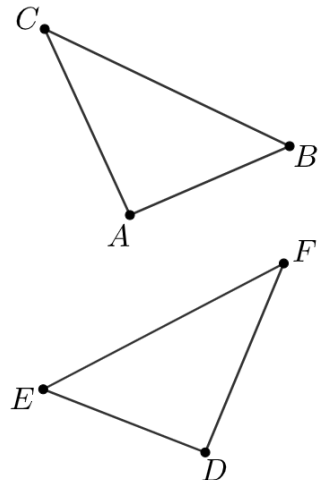
What do you notice? What do you wonder?



### Explore

In the figure,  $\triangle ABC$  is congruent to  $\triangle DEF$ .

- A. Find a rigid transformation that takes  $\triangle ABC$  to  $\triangle DEF$ .

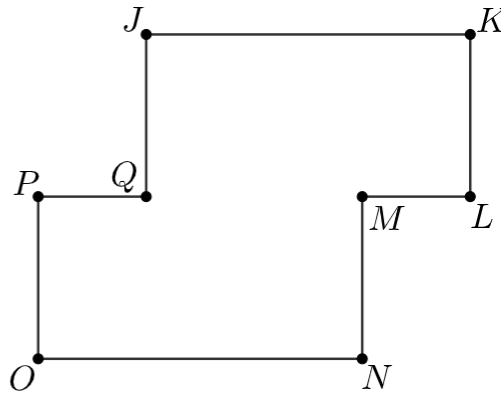
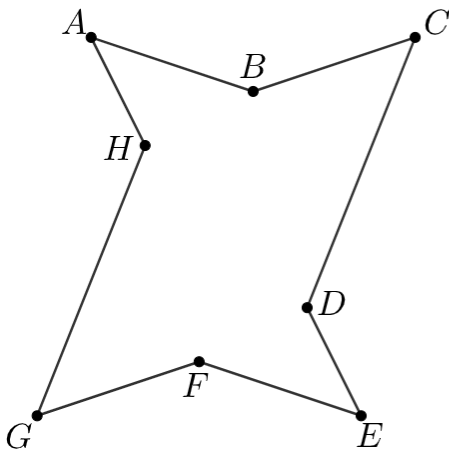


B. What is the image of segment  $\overline{BC}$  after that transformation?

C. Explain how you know those segments are congruent.

D. Justify that  $\angle ABC \cong \angle DEF$ .

For each figure, draw additional line segments to divide the figure into two congruent polygons. Label any new vertices and identify the corresponding vertices of the congruent polygons.

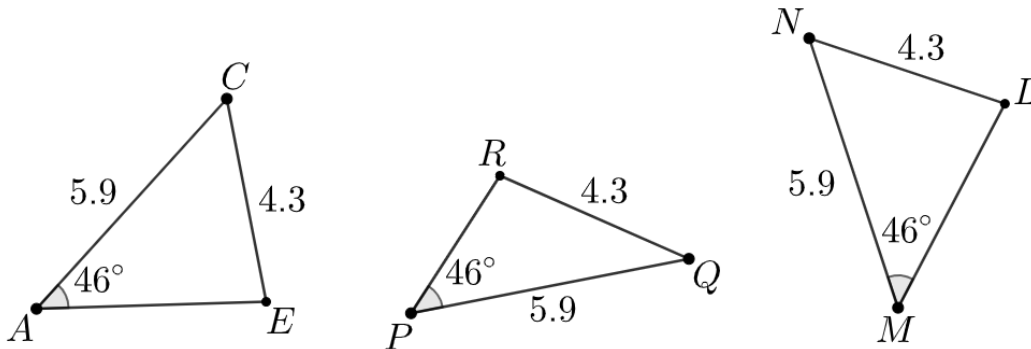


### Theorem

If two figures are congruent, then corresponding parts of those figures must be congruent.

### Discuss

Here are three triangles.

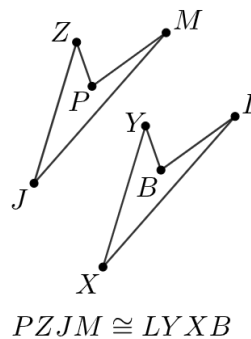
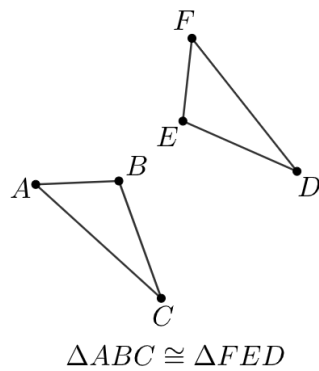


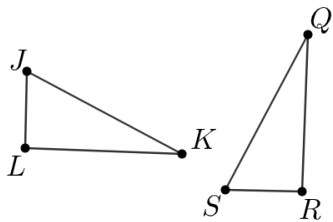
A.  $\triangle ACE$  is congruent to which triangle? Explain your reasoning.

B. Describe a rigid transformation that takes  $\triangle ACE$  to that triangle. Draw each step of the transformation.

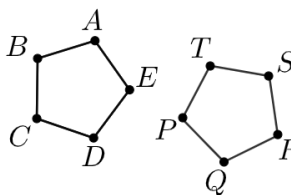
### Demonstrate

Each pair of figures is congruent. Decide whether each congruence statement is true or false.





$$\triangle JKL \cong \triangle QRS$$

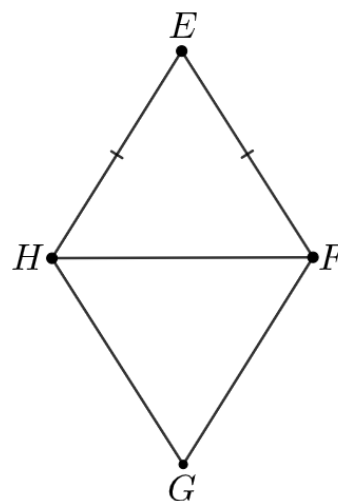


$$ABCDE \cong PQRST$$

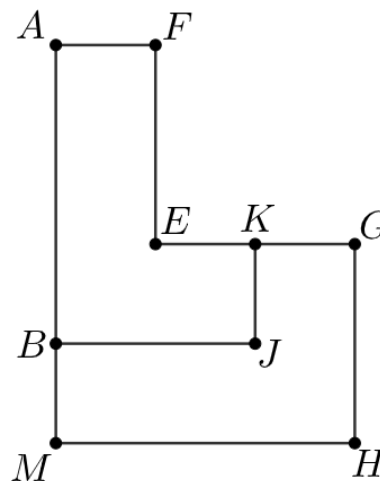
### Practice

1. Triangle  $\triangle FGH$  is the image of isosceles triangle  $\triangle FEH$  after a reflection across segment  $\overline{HF}$ . Select **all** the statements that are a result of corresponding parts of congruent triangles being congruent.

- A.  $EFGH$  is a rectangle
- B.  $EFGH$  has 4 congruent sides
- C. Diagonal  $\overline{FH}$  bisects angles  $\angle EFG$  and  $\angle EHG$
- D. Diagonal  $\overline{FH}$  is perpendicular to side  $\overline{FE}$
- E. Angle  $\angle FEH$  is congruent to angle  $\angle FGH$

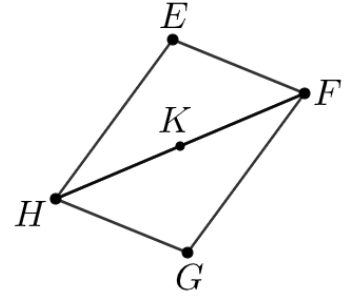


2. Figure  $MBJKGH$  is the image of figure  $AFEKJB$  after being rotated  $90^\circ$  counterclockwise about point  $K$ . Draw a segment in figure  $AFEKJB$  to create a quadrilateral. Draw the image of the segment when rotated  $90^\circ$  counterclockwise about point  $K$ . Write a congruence statement for the quadrilateral you created in figure  $AFEKJB$  and the image of the quadrilateral in figure  $MBJKGH$ .



3. Triangle  $\triangle HEF$  is the image of triangle  $\triangle FGH$  after a  $180^\circ$  rotation about point  $K$ . Select **all** statements that must be true.

- A.  $\triangle FGH \cong \triangle FEH$
- B.  $\triangle EFH \cong \triangle GFH$
- C.  $\angle KHE \cong \angle KFG$
- D.  $\angle GHK \cong \angle KHE$
- E.  $\overline{EH} \cong \overline{FG}$
- F.  $\overline{GH} \cong \overline{EF}$



4. Triangle  $\triangle A'B'C'$  is a reflection of triangle  $\triangle ABC$  across line  $\overleftrightarrow{BC}$ . Justify why  $\overleftrightarrow{BC}$  is the angle bisector of angle  $\angle ABA'$ .

