

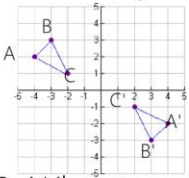
Warm-Up

Congruence

1. What does it mean to say two shapes are congruent?

They have the same side lengths and angles

2. Identify the transformation shown.



Rotation of 180° about the origin

3. What transformations keep angle measure, and side lengths?

Rotation, Reflection, Translation

Which do not?

Dilations.

What are these types of transformations called?

Rigid Motions

Vocabulary

Congruence

Congruence - have the same size and shape. Two figures are defined to be congruent if there is a sequence of rigid motions that maps one to the other.

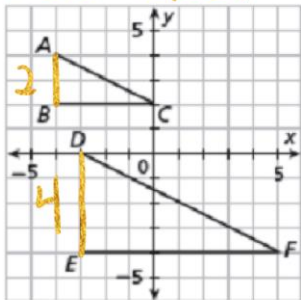
Rigid motion - a transformation that preserves side lengths and angles

Reflection, Rotation, Translation

Use the definition of congruence in terms of rigid motions to determine whether the two figures are congruent and explain your answer.

1.

$\triangle ABC \rightarrow \triangle DEF$

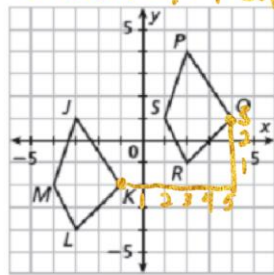


$\triangle ABC$ can be mapped onto $\triangle DEF$ by a dilation with scale factor of 2. A dilation is not a rigid motion. Only rigid motions create congruent figures.

Thus, $\triangle ABC \not\cong \triangle DEF$

Use the definition of congruence in terms of rigid motions Congruence
to determine whether the two figures are congruent and
explain your answer.

2. JKLM \rightarrow PQRS



JKLM can be mapped onto PQRS
by a translation $(x, y) \rightarrow (x+5, y)$.
A translation is a rigid motion.
A rigid motion creates congruent
figures, Thus, $JKLM \cong PQRS$.

Congruence

Now you try

2
Mike E.

ABC can be mapped
onto DEF by a
reflection over y axis
A reflection is a
rigid motion
A rigid motion create
congruent figure Thus
 $ABC \cong DEF$

Problems ~~12~~

3 Dwight

ABCD can be mapped into
EFGH by a rotation C.C
A rotation is a rigid 180°
motion. Rigid motions
create congruent figures.
Thus $ABCD \cong EFGH$

Congruence

Is congruence still preserved when
doing more than one rigid motion?

Yes it is a sequence of
Rigid Motions

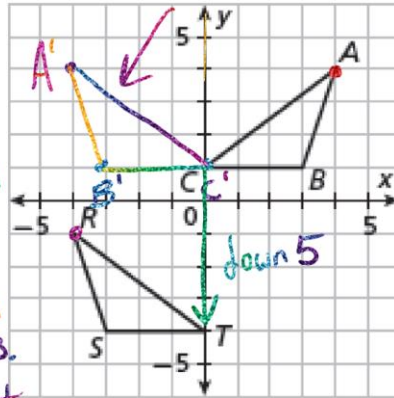
Congruence

Find a sequence of rigid motions that maps one figure to the other.

Write the sequence in coordinate notation and determine if the figures are congruent.

How could you map $\triangle ABC$ to $\triangle RST$?

$\triangle ABC$ can be mapped $\triangle RST$ by reflection over y axis then a translation $(x,y) \rightarrow (x,y-5)$. A reflection then a translation is a sequence of rigid motions. Rigid motions create congruent figures. Thus $\triangle ABC \cong \triangle RST$.



Congruence

Find a sequence of rigid motions that maps one figure to the other.

Write the sequence in coordinate notation.

How could you map $\triangle DFG$ to $\triangle HJK$?

$\triangle DFG$ is mapped onto $\triangle HJK$ by rotation 90 ccw and then translation $(x,y) \rightarrow (x,y+1)$. A rotation and then translation is a rigid motion. Rigid motion creates congruent figures. Thus, $\triangle DFG \cong \triangle HJK$.

