

Geometry CC - Unit 4
 Lesson 1: Intro to Rigid Motions
 M1 L12

Homework: HW Handout 4.1

Transformation - An operation that maps (moves) an original geometric figure onto a new figure

Preimage - Original figure

Image - New figure

Translation

Reflection

Rotation

Relevant Vocabulary

Basic Rigid Motion: A basic rigid motion is a rotation, reflection, or translation of the plane.

Basic rigid motions are examples of transformations. Given a transformation, the image of a point A is the point the transformation maps A to in the plane.

Distance-Preserving: A transformation is said to be *distance-preserving* if the distance between the images of two points is always equal to the distance between the pre-images of the two points.

Angle-Preserving: A transformation is said to be *angle-preserving* if (1) the image of any angle is again an angle and (2) for any given angle, the angle measure of the image of that angle is equal to the angle measure of the pre-image of that angle.

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In the table below, use the diagram to identify the type of rigid motion and to state what specific information is needed to perform the rigid motion.

Diagram	Name of Rigid Motion	Specific Information Needed to Perform the Rigid Motion
	Rotation	<ul style="list-style-type: none"> • center of rotation • direction (cw or ccw) • number of degrees
	Reflection	<ul style="list-style-type: none"> • line of reflection is the \perp bisector formed by a pt in its image.
	Translation	<ul style="list-style-type: none"> length and degree measure of the vector.

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Reflection (Flip)
Transformation over a line of reflection

PREIMAGE R
IMAGE R

Line of reflection

Each point of the preimage is the same distance from the line of reflection as the corresponding point on the image

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Translation (Slide or Glide)
Transformation that moves all points of the preimage the same distance and in the same direction to create the image.

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Rotation (Turn)
 Transformation around a center of rotation with a specific angle of rotation and in a certain direction (clockwise or counterclockwise).

Each point of the preimage and the image are the same distance from the center.

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Labeling Transformations

Corresponding labels on the image are labeled with "prime"
 $A' = A$ prime

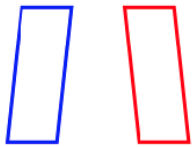
Mapping

$\triangle ABC$ maps onto $\triangle DEF$
 this implies:
 $A \rightarrow D$
 $B \rightarrow E$
 $C \rightarrow F$

Name the transformation *Translation*

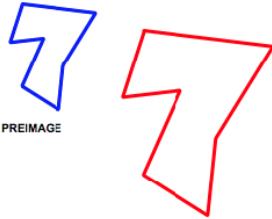
Oct 12-9:05 AM

State if the following transformations are considered a rigid motion. If so, state the type of transformation.



PREIMAGE IMAGE

rigid motion
reflection



PREIMAGE IMAGE

Not a rigid
motion

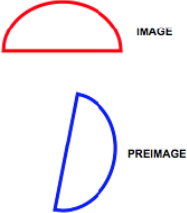


IMAGE PREIMAGE

rigid motion
rotation





IMAGE PREIMAGE

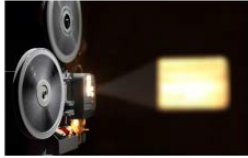
Not a rigid
motion

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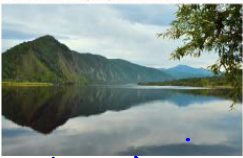
State if the following transformations are considered a rigid motion. If so, state the type of transformation.




rigid motion
reflection




not a rigid
motion



rigid motion
reflection



rigid motion
rotation



rigid motion
translation

Oct 12-9:06 AM