3.4 Classification of Rigid Motion

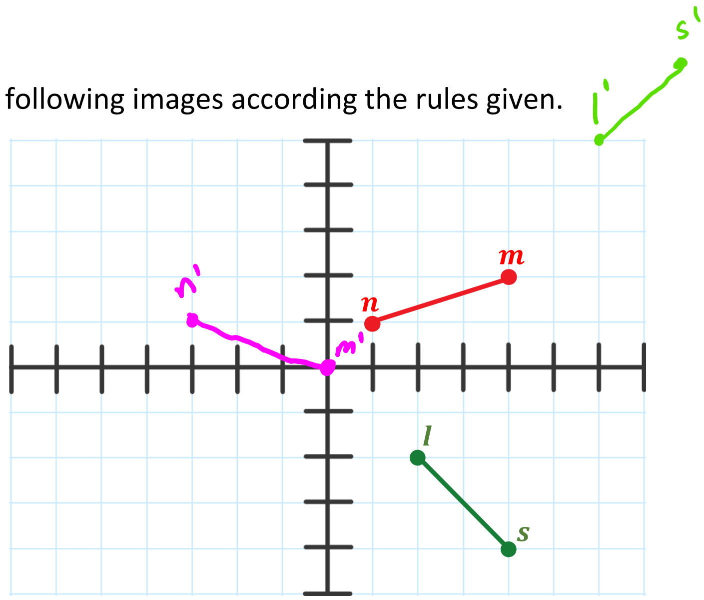
Monday, September 23, 2019 7:46 AM

Warm Up

Translat**e, Rot**ate, and/or Reflect the following images according the rules given.

$R_{x-axis} \circ T_{\langle -4,-2 \rangle}(\overline{MN})$

$T_{\langle 4,3 \rangle} \circ r_{(90°,O)}(\overline{SL})$



Essential Question

How can rigid motions be classified?

Needed Vocab:

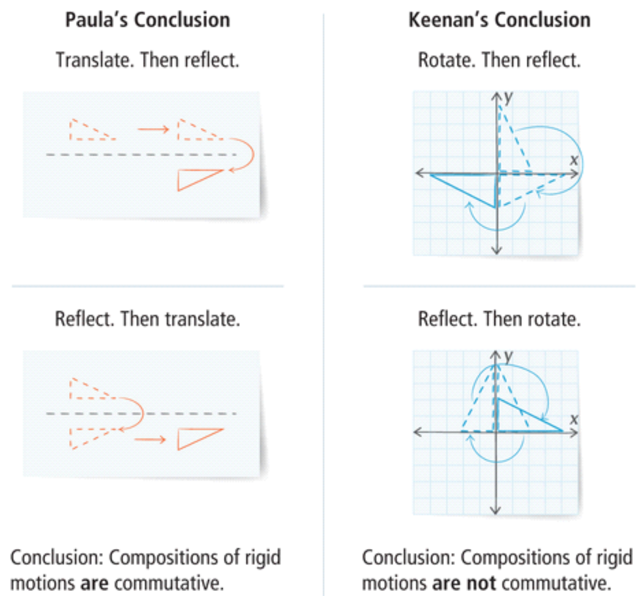
► **Glide Reflection**

Goal: "I can. . .

Identify different rigid motions used to transform two-dimensional shapes."

Two students are trying to determine whether compositions of rigid motions are commutative. View all of their work in the gallery of images.

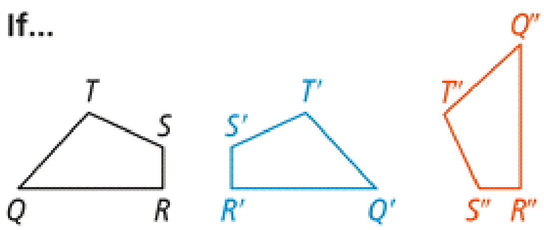
A. Should Paula have used graph paper? Explain.
B. Do you agree with Paula or Keenan? Explain.



Rigid Motion Composition

The composition of two or more rigid motions is a rigid motion.

If...



M: $QRST \to Q'R'S'T'$ and
N: $Q'R'S'T' \to Q''R''S''T''$ are rigid motions.

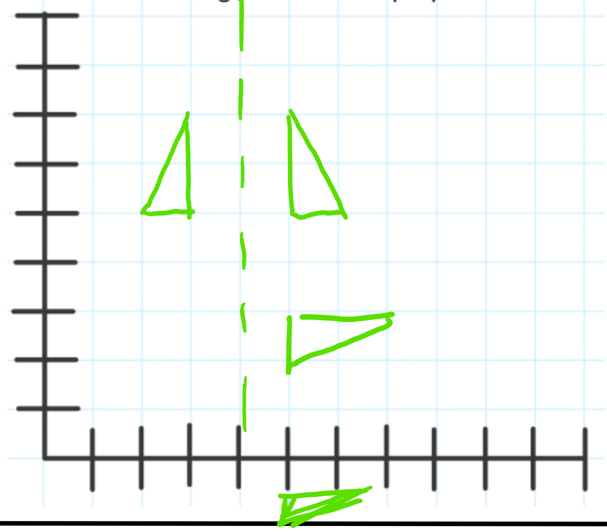
Then...

$(N \circ M)$: $QRST \to Q''R''S''T''$ is a rigid motion.

PROOF: SEE EXAMPLE 1.

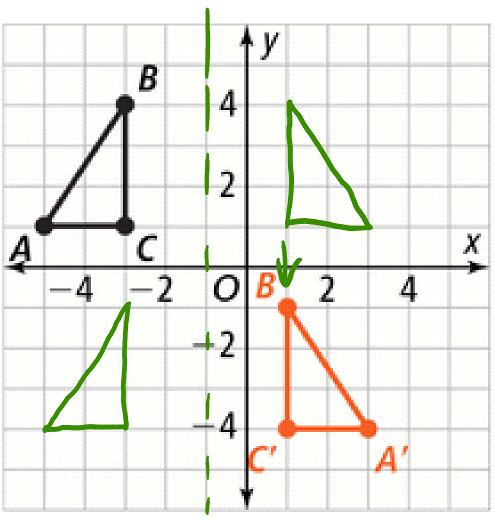
How can we **prove** that a composition of rigid motions is a rigid motion?

Use the Diagram for visual purposes.



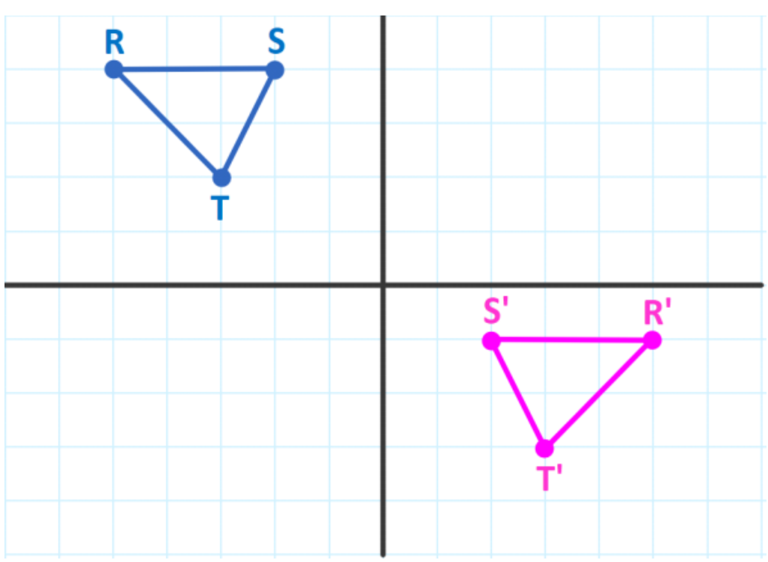
Example 1

Is there a rigid motion that maps ΔABC to ΔA'B'C'?



$R_{(x=-1)} \circ T_{\langle \emptyset,-5\rangle}$

What is the glide reflection that maps ΔRST to ΔR'S'T'.



$\boxed{R_{(y\text{-axis})} \circ T_{\langle \emptyset,-5\rangle}}$

Glide Reflection

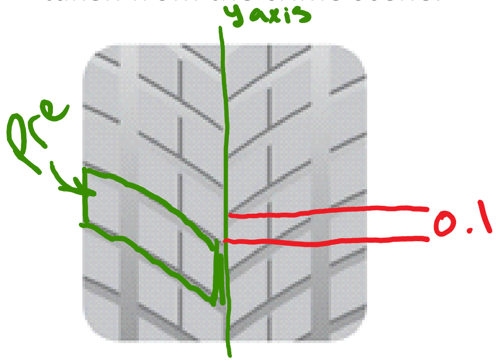
$T_{\langle\ \ \rangle} \circ R_{(\ \ )}$

$R_{(\ \ )} \circ T_{\langle\ \ \rangle}$

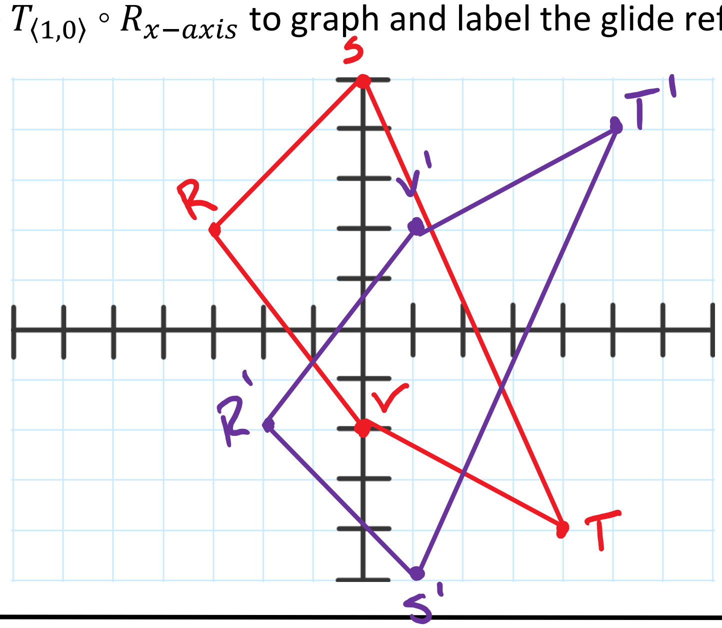
Reflection is H. or V.
The translation is the other.

Example 2

A digital artist is reproducing a tire tread pattern from a partial tire print from a crime scene by applying a glide reflection. She uses the rule $T_{\langle 0,0.1\rangle} \circ R_{y-axis}$ to generate a pattern. Confirm that her rule can be applied to the partial pattern that was taken from the crime scene.

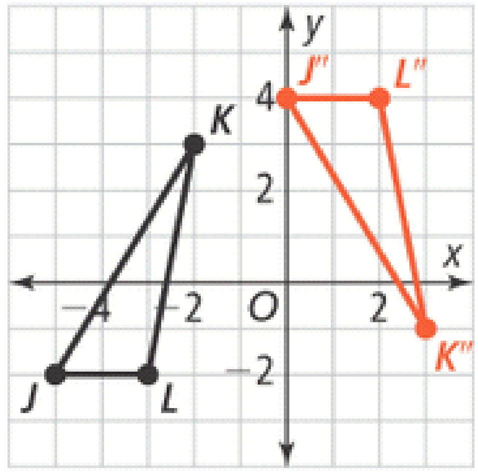


Quadrilateral RSTV has vertices R(-3, 2), S(0, 5), T(4, -4), V(0, -2). Use the rule $T_{\langle 1,0\rangle} \circ R_{x-axis}$ to graph and label the glide reflection of RSTV.

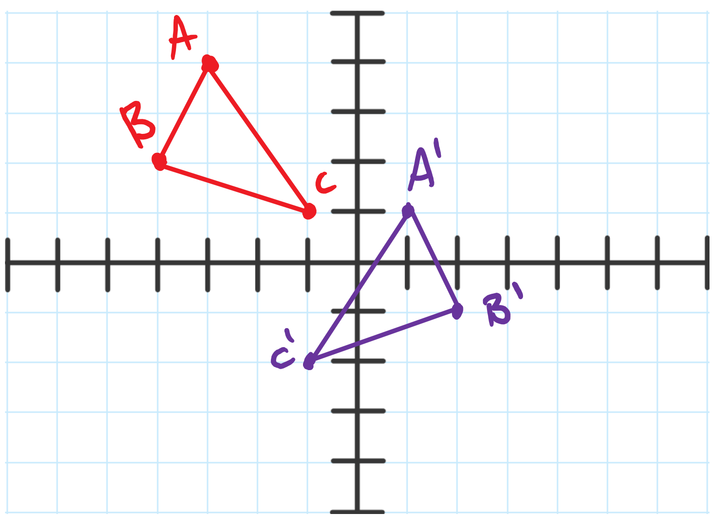


What is the glide reflection that maps ΔJKL to ΔJ"K"L"?

$T_{\langle 5,\emptyset\rangle} \circ R_{(y=1)}$



What is the glide reflection that maps the following?
ΔABC→ΔA'B'C' given:
A(-3, 4), B(-4, 2), C(-1, 1), A'(1, 1), B'(2, -1), and C'(-1, -2).

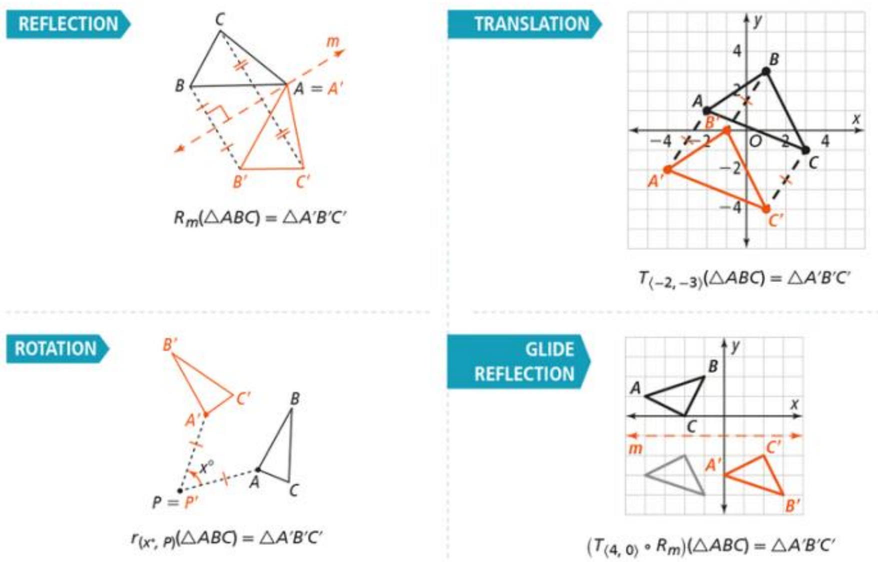


$T_{\langle \emptyset,-3\rangle} \circ R_{(x=-1)}$

What is the glide reflection that maps the following?
$\overline{RS}$→$\overline{R'S'}$ given:
R(-2, 4), S(2, 6), R'(4, 0), and S'(8, -2).

$T_{\langle 6,\emptyset\rangle} \circ R_{y=2}$

Types of Rigid Motions



Homework

Pg. 134
9, 10, 12-21, 25, 26