








LESSON 2

TASK ANALYSIS

Step	(✓)	Task
STEP 1		Listen to or read the math story.
STEP 2		Identify the problem.
STEP 3		Plot the original figure(s) on the coordinate plane.
STEP 4		Plot the transformed figure(s) on the coordinate plane.
STEP 5		Identify the transformations on the coordinate plane.
STEP 6		State the solution to the math story problem.
STEP 7		Fill in the big ideas.

STEP
1

Read the math story.

Painting with Transformations

Maria is an artist. She is painting a landscape picture. She has already painted some mountains, but she wants to reflect the mountain in the lake below it. The reflection must match the mountain exactly. She also painted a bird on the ground. She wants to paint another bird just like it to look like the bird has taken flight.

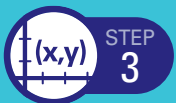
Figure 1: Maria plotted the points of the first figure using these coordinates: $(1, 2)$, $(3, 2)$, and $(5, 2)$. She connected the points with curved lines. To transform the figure, she plotted these coordinates $(5, 6)$, $(7, 6)$, and $(9, 6)$. She connected these points with curved lines.

Figure 2: Maria plotted these coordinates for the second figure: $(-10, 0)$, $(-7, 6)$, $(-5, 2)$, $(-3, 6)$, and $(0, 0)$. She connected these points with straight lines. To transform this figure, she plotted these coordinates $(-10, 0)$, $(-7, -6)$, $(-5, -2)$, $(-3, -6)$, and $(0, 0)$. She connected these points with straight lines.

What types of transformations did Maria use?

STEP
2

Identify the problem.



STEP
3

Plot the original figure(s).



STEP
4

Plot the transformed figure(s).



STEP
5

Identify the transformations.

Figure 1

Original

$(1, 2)$ $(3, 2)$ $(5, 2)$

Transformed

$(5, 6)$ $(7, 6)$ $(9, 6)$

Figure 2

Original

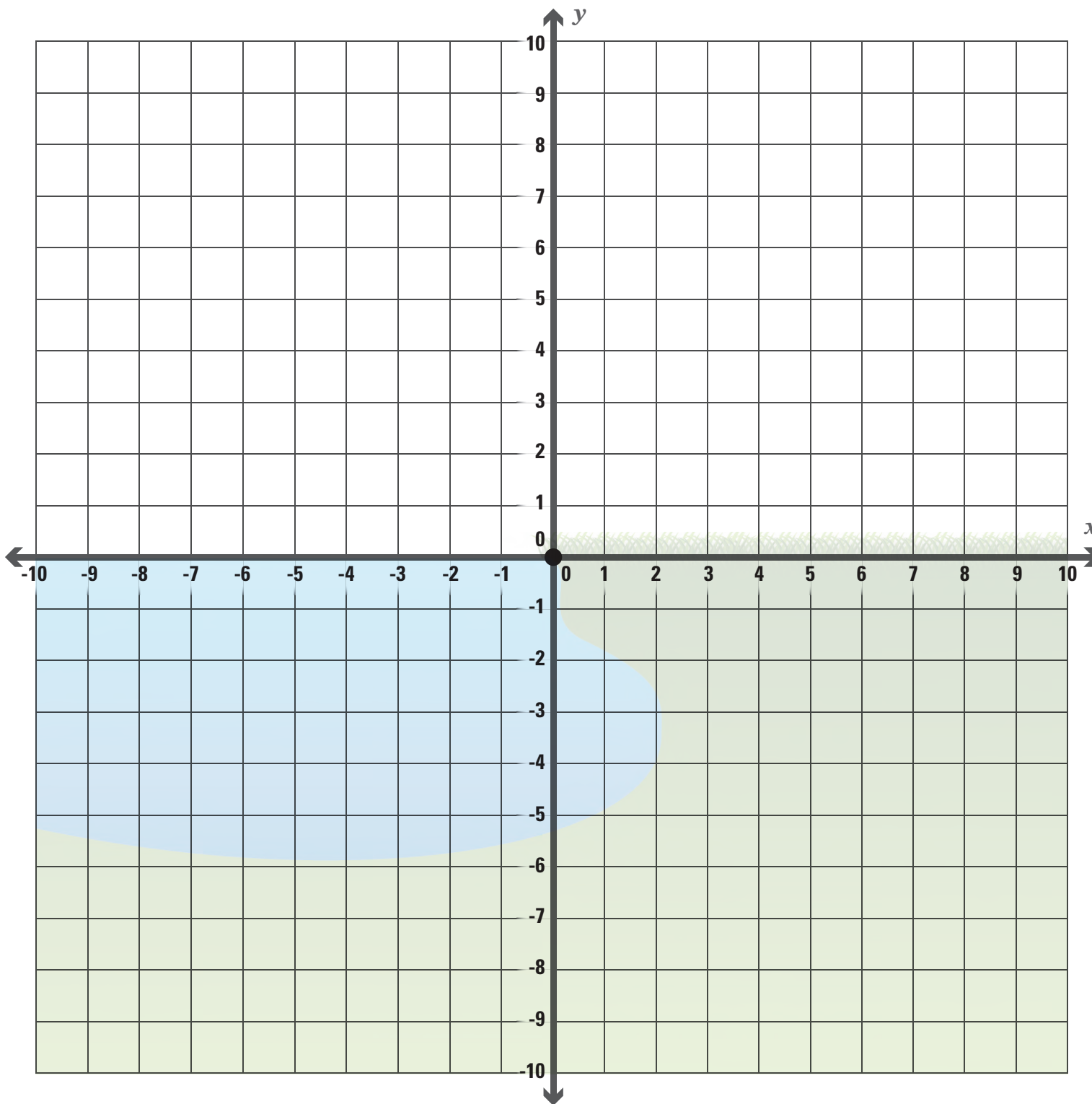
$(-10, 0)$ $(-7, 6)$

$(-5, 2)$ $(-3, 6)$ $(0, 0)$

Transformed

$(-10, 0)$ $(-7, -6)$

$(-5, -2)$ $(-3, -6)$ $(0, 0)$





State the solution to the math story problem.

Maria used a **reflection translation** for the bird

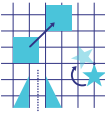

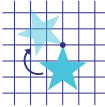

and a **reflection translation** for the mountains.



Fill in the big ideas.

A _____ is a movement of a shape on a plane.

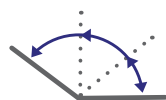
A translation _____ and a reflection _____.

Word Bank			
 <p>transformation</p>	 <p>flips</p>	 <p>rotation</p>	 <p>slides</p>

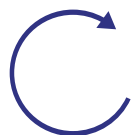
GLOSSARY

SYMBOLS

$\angle ABC$ angle	\cong is congruent to	90° degree
\sim similar to	$\triangle LMN$ triangle	



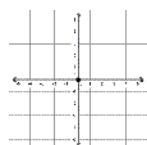
angle: the amount of space between two lines that intersect at a given point



clockwise: moving in the direction of the hands on a clock



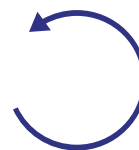
congruent triangles: identical triangles with exactly the same three sides and the same three angles



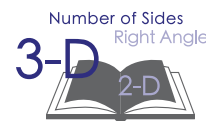
coordinate plane: a plane containing an x -axis and a y -axis

(x, y)

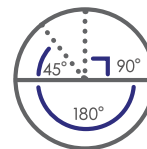
coordinates (x, y) : pairs of numbers that tell an exact position



counterclockwise: moving in the opposite direction of the hands on a clock



definition: in proofs, a description of a shape or its attributes



degree: a measure of the size of an angle



diagonal: a line segment that goes from one corner to another, but is not an edge

$x + y = z$

equation: an expression that two expressions are equal

GLOSSARY



flip: to turn something over



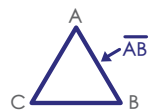
given: facts that are told in the information about the problem



horizontal: going side to side like the horizon



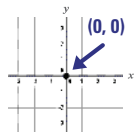
interior angle: the angle inside a shape



line segment: a line between two points (named by the points on each end)



negative number: a number less than zero



origin point: the point where the x -axis and the y -axis meet $(0, 0)$



positive number: a number greater than zero



postulate: a statement that everyone agrees is true without the need for proof



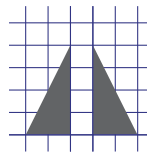
proof: logical arguments used to show the truth of a mathematical statement



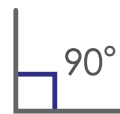
property: a characteristic or attribute something like a shape has



reason: a statement or fact that explains why something is the way it is



reflection: a flip of a shape to create a mirror image

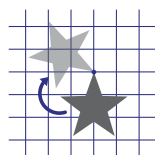


right angle: an angle of 90°

GLOSSARY



right triangle: a triangle with a right angle



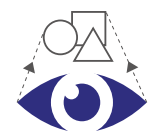
rotation: a circular movement around a point



similar triangles: triangles that have the same size interior angles; the lengths of their sides may be different



slide: to move a shape without turning it or flipping it



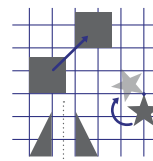
statement: information about a shape's measurements and properties learned by observing the shape



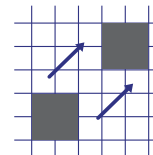
symmetry: another name for reflection; when one half is a reflection of the other half



theorem: a result that has been proved to be true (using operations and known facts)



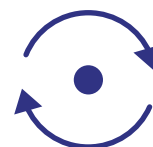
transformation: changing a shape using a turn, a flip, or a slide



translation: a slide of a shape horizontally, vertically, or diagonally



triangle: a shape with 3 sides and 3 angles



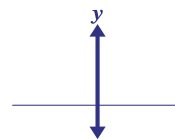
turn: to rotate around a point



vertical: going in an up and down direction, upright



x-axis: a line on a graph that runs horizontally (left-to-right)



y-axis: a line on a graph that runs vertically (up and down)