9.5

Composition of Transformations

WHAT IS IT????

When a transformation is applied to a figure, and **then** another transformation is applied to its _____, the result is called a _____ of the _____.
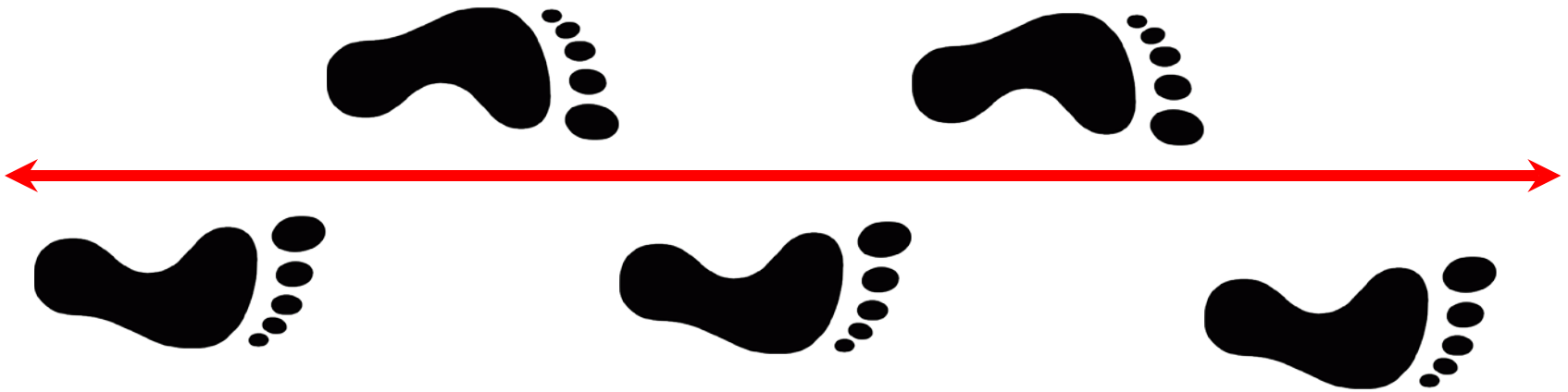
A **glide reflection** is the composition of a translation followed by a reflection in a line parallel to the translation vector.

Example

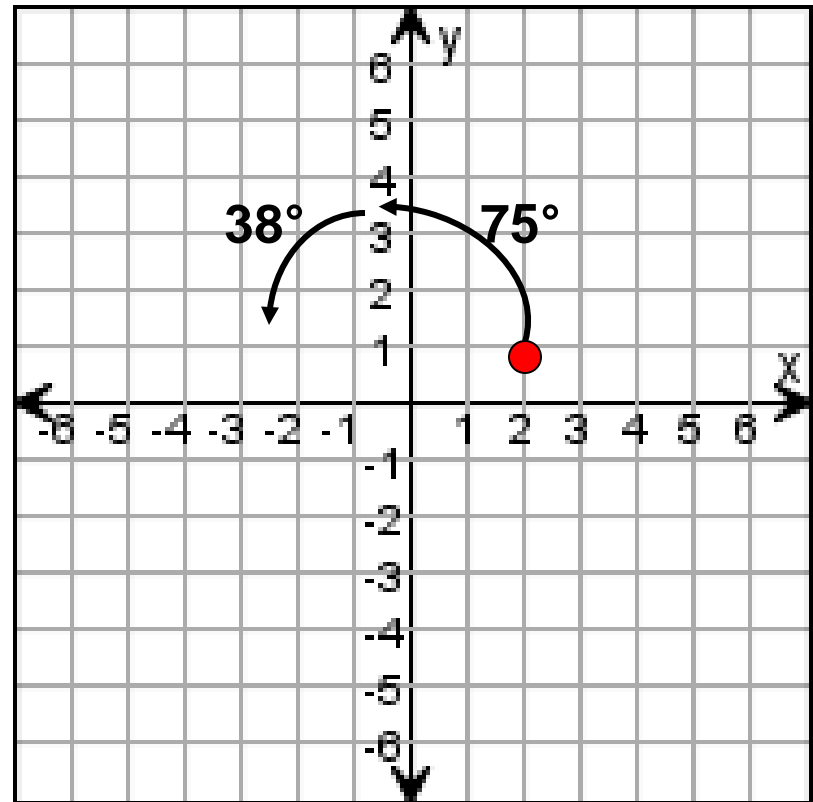The glide reflection shown is the composition of a translation along $\vec{w}$ followed by a reflection in line ℓ.
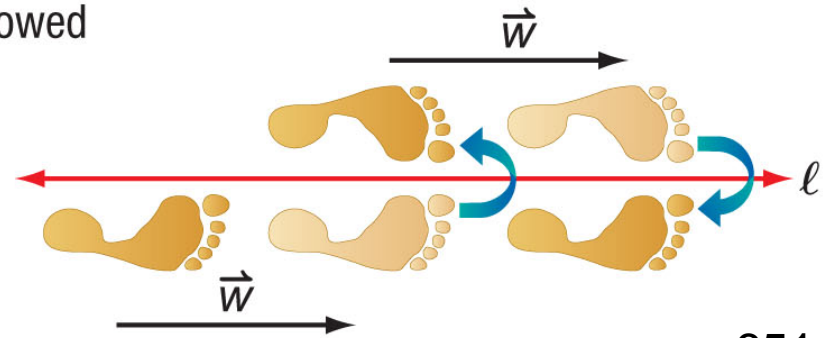
Find a single transformation for a 75° counterclockwise rotation with center (2,1) followed by a 38° counterclockwise rotation with center (2,1)
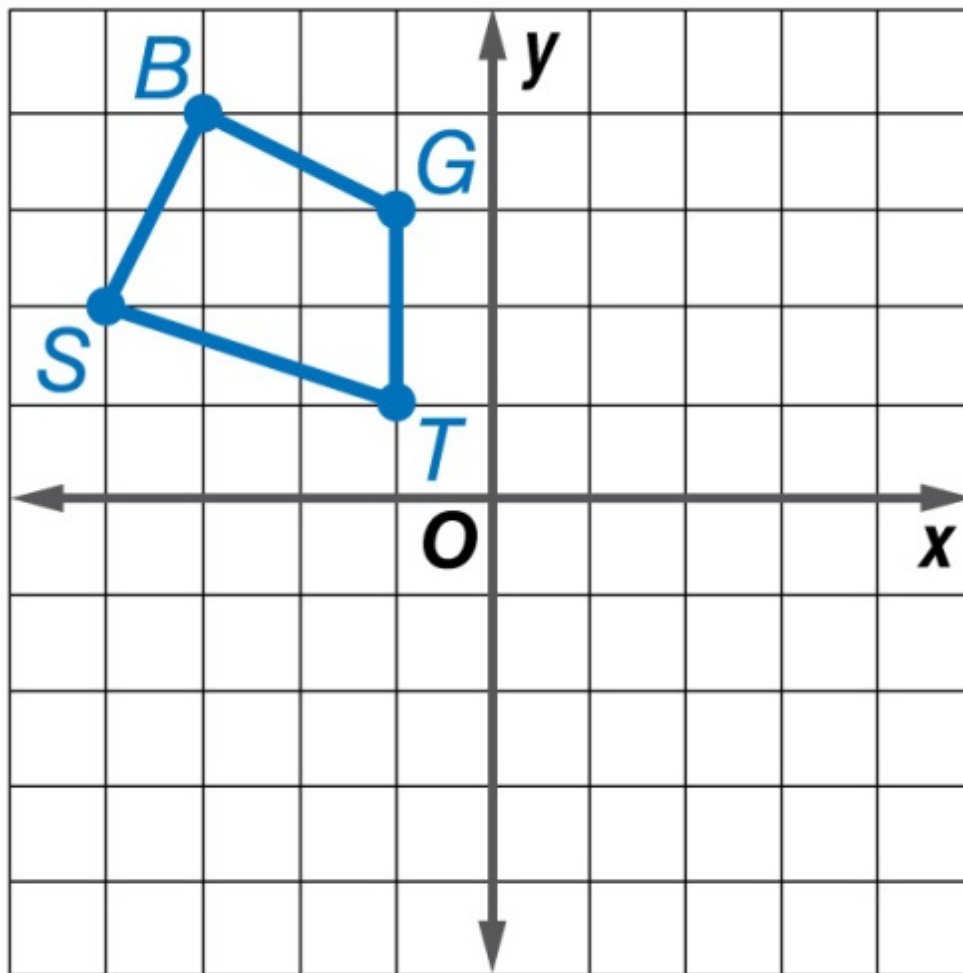
113° counterclockwise rotation with center (2,1)

Find a single transformation equivalent to a translation with vector <−2, 7> followed by a translation with vector <9, 3>.

Translation with vector <7, 10>
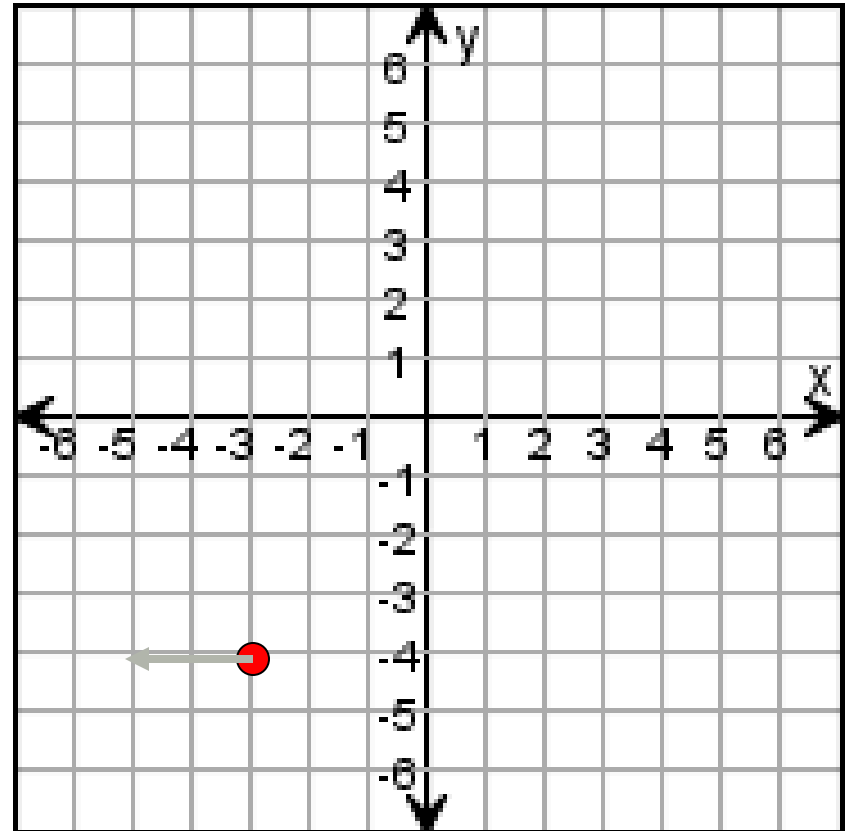
Practice

Quadrilateral *BGTS* has vertices *B*(−3, 4), *G*(−1, 3), *T*(−1 , 1), and *S*(−4, 2). Graph *BGTS* and its image after a translation along ⟨5, 0⟩ and a reflection in the *x*-axis.

Practice

Quadrilateral *RSTU* has vertices *R*(1, −1), *S*(4, −2), *T*(3, −4), and *U*(1, −3). Graph *RSTU* and its image after a translation along ⟨−4, 1⟩ and a reflection in the *x*-axis. Which point is located at (−3, 0)?
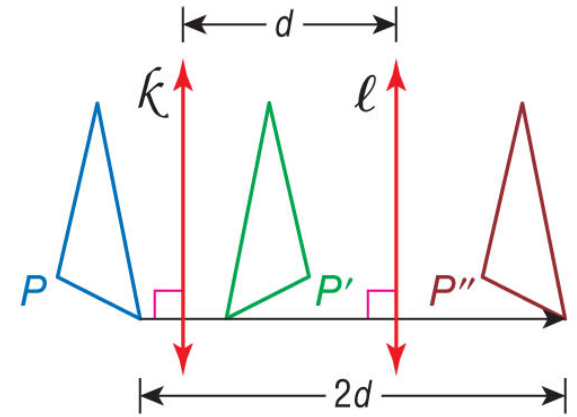
A. *R'*

B. *S'*

C. *T'*

D. *U'*
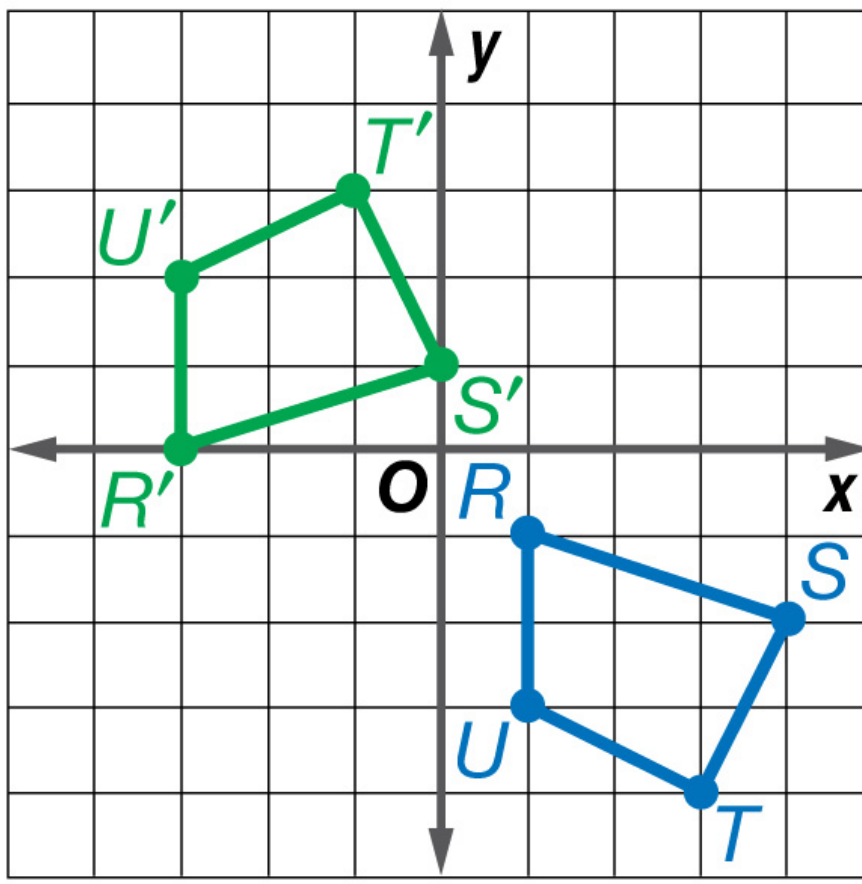
Definitions

An _____ is a transformation that preserves shape and size.

Translations, reflections and rotations are _____..

Theorem 9.2 Reflections in Parallel Lines

The composition of two reflections in parallel lines can be described by a translation vector that is

• perpendicular to the two lines, and
• twice the distance between the two lines.

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Reflections over two parallel lines equals…

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Reflections over two intersection lines equals