

Geometry Lesson 67

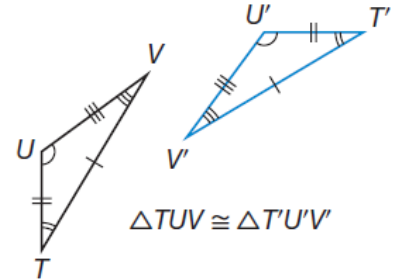
Objective: TSW understand the basics of transformations.

_____ - A change in position, size, or shape of a figure. Translations, reflections, and rotations are examples of a special class of transformation called isometries.

_____ - The original figure in a transformation.

_____ - The shape that results from the transformation.

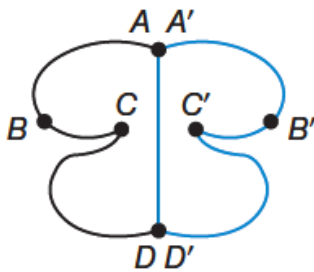
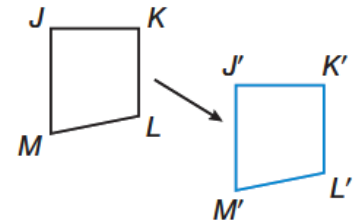
An _____ maps a figure to a congruent figure - An isometry is a transformation that does not change the size or shape of a figure. That is, the image of an isometry is congruent to its preimage. This diagram shows an isometry with preimage



The small ' marks next to T , U , and V are _____: a symbol used to label the image in a transformation.

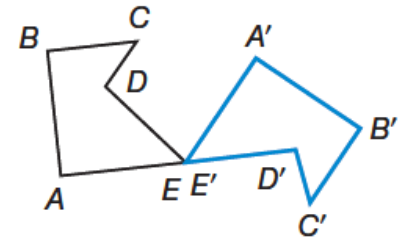
An isometry is also called a congruence transformation or rigid transformation.

_____ (Slide) - A type of transformation that shifts or slides every point of a figure the same distance in the same direction as shown with parallelogram $JKLM$.



_____ (Flip) - A transformation across a line (the line of reflection) such that the line is the perpendicular bisector of each segment joining each point and its image (If a point lies on the line of reflection, the point and its image will be the same.) In this diagram, the figure has been reflected across \overleftrightarrow{AD} . Each point of the preimage is the same distance from \overleftrightarrow{AD} as its matching point on the reflected image.

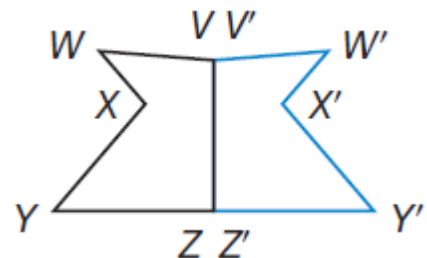
_____ (Turn) - A transformation about a point (the point or center of rotation) such that each point and its image are the same distance from that point, and angles formed by a point, its image, and the point of rotation (as the vertex) are congruent. In this diagram, $ABCDE$ has been rotated clockwise about E . Notice that $EA = EA'$, $EB = EB'$, $EC = EC'$, and $ED = ED'$; notice also that $\angle AEA'$, $\angle BEB'$, $\angle CEC'$, and $\angle DED'$ are all congruent. Since E is the point of rotation, E and E' are the same point.



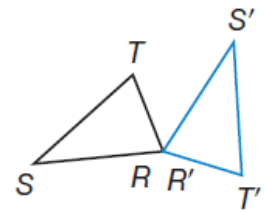
Example 1 Identifying Transformations

a. Identify the type of transformation illustrated below.

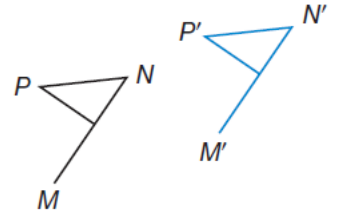
SOLUTION



b. Identify the type of transformation illustrated below.
 SOLUTION

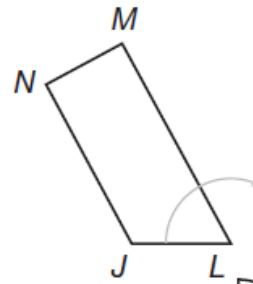


c. Identify the type of transformation illustrated below.
 SOLUTION



Example 2 Performing Transformations
 Perform the indicated transformations.

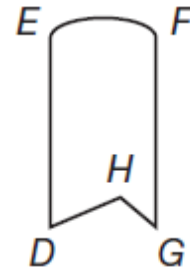
a. Rotate the figure about point L.
 SOLUTION



b. Translate the figure as indicated.
 SOLUTION



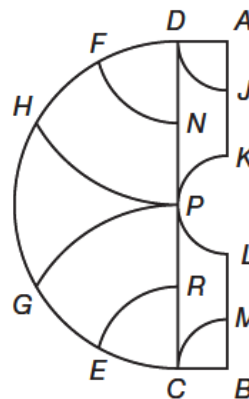
c. Reflect the figure across \overleftrightarrow{FG} .
 SOLUTION



Example 3 Application: Stained Glass Design

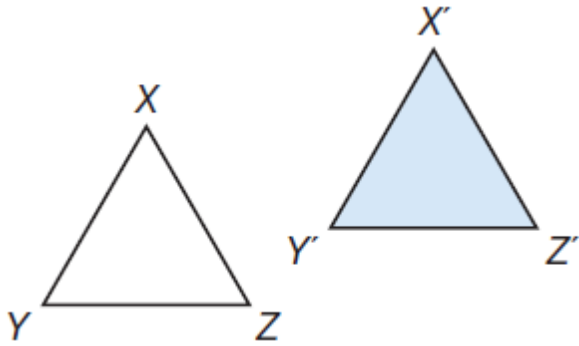
Often stained glass designers use vertical or horizontal symmetry to reduce the time it takes to design a project. Reflect this template across the vertical line \overleftrightarrow{AB} to complete the design.

SOLUTION

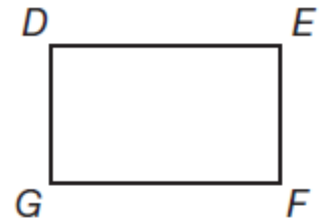


You Try!!!!

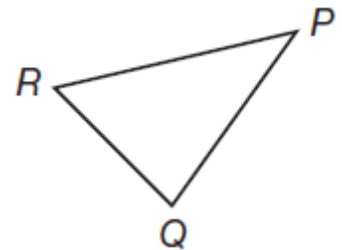
a. Identify the type of transformation which takes ΔXYZ to $\Delta X'Y'Z'$.



b. Reflect rectangle $DEFG$ across \overleftrightarrow{GF} . Label the image.



c. Rotate ΔPQR clockwise about point Q , so that Q' and P' are collinear with \overline{QR} .



d. This simplified blueprint shows the first two floors of the front of a new civic hall. The third floor will be a translation of the second floor so it is directly above the 2nd floor. Complete the plan by performing the translation.

