Transformations

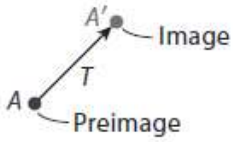
Tuesday, September 25, 2018 7:41 PM

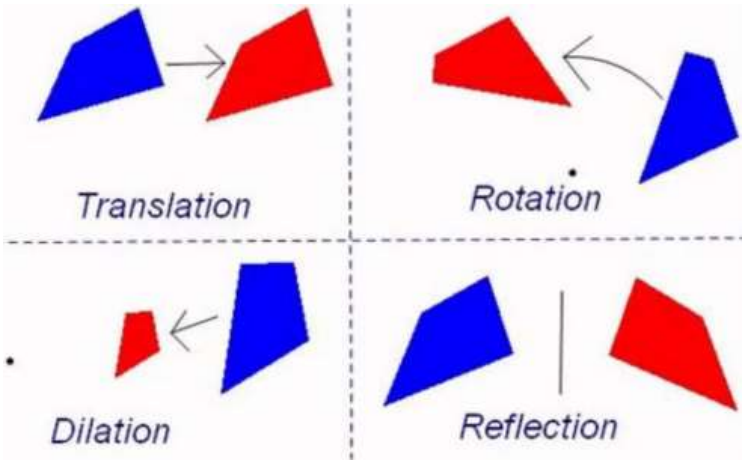
Transformations

A function that changes the **position, shape, and/or size** of a figure

Preimage--> Image

*Use "**prime notation**"*





Rigid Motions

• Rigid motions preserve distance. • Rigid motions preserve angle measure. • Rigid motions preserve betweenness.	• Rigid motions preserve collinearity. • Rigid motions preserve parallelism.

Translation

Right a units	Add a to the x-coordinate: $(x, y) \rightarrow (x + a, y)$
Left a units	Subtract a from the x-coordinate: $(x, y) \rightarrow (x - a, y)$
Up b units	Add b to the y-coordinate: $(x, y) \rightarrow (x, y + b)$
Down b units	Subtract b from the y-coordinate: $(x, y) \rightarrow (x, y - b)$

Rotation

Degree	Clockwise	Counterclockwise
90°	(x, y) → (y, -x)	(x, y) → (-y, x)
180°	(x, y) → (-x, -y)	(x, y) → (-x, -y)
270°	(x, y) → (-y, x)	(x, y) → (y, -x)
360°	(x, y) → (x, y)	(x, y) → (x, y)

Reflection

Reflection about the x- axis	(x, y)	(x, -y)
Reflection about the y-axis	(x, y)	(-x, y)
Reflection about the line y = x	(x, y)	(y, x)
Reflection about the line y = -x	(x, y)	(-y, -x)
Reflection about the origin	(x, y)	(-x, -y)

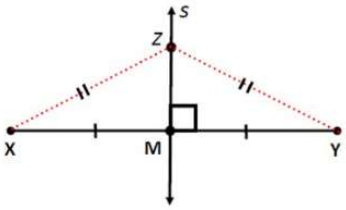
Perpendicular Bisector

Example:

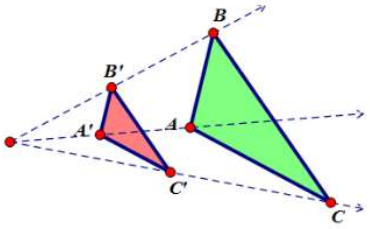
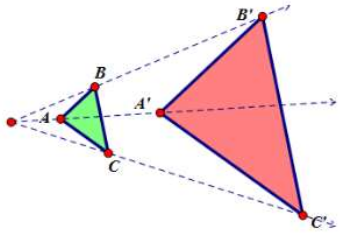
Line *s* is perpendicular to $\overline{XY}$.

M is the midpoint, therefore $\overline{XM} \cong \overline{MY}$.

Z lies on line *s* and is equidistant from X and Y.

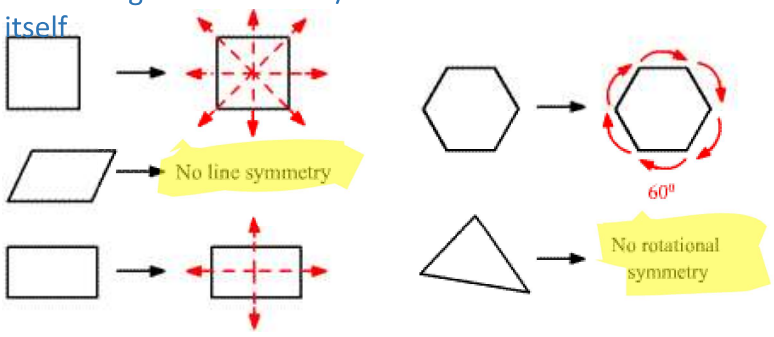


Dilation

Scale Factor 0 < k < 1	Scale Factor k > 1
	
$B'C' < BC$ and $\frac{B'C'}{BC} = k < 1$ $A'C' < AC$ and $\frac{A'C'}{AC} = k < 1$ $A'B' < AB$ and $\frac{A'B'}{AB} = k < 1$	$B'C' > BC$ and $\frac{B'C'}{BC} = k > 1$ $A'C' > AC$ and $\frac{A'C'}{AC} = k > 1$ $A'B' > AB$ and $\frac{A'B'}{AB} = k > 1$

Symmetry

When a figure is reflected/ rotated so it is carried onto itself



***To find degrees of rotational symmetry, divide 360 by the # of turns*