

TRANSFORMATIONS: Different ways to manipulate a point, line or shape

Transformations: When an image is congruent to its pre-image.

PRESERVES SHAPE + SIZE

TRANSLATIONS

A translation is a transformation that slides each point of a figure the same distance and direction.

Rule Notation:

- Translating LEFT # Units
 $(x, y) \rightarrow (x - \#, y)$
- Translating RIGHT # Units
 $(x, y) \rightarrow (x + \#, y)$
- Translation DOWN # Units
 $(x, y) \rightarrow (x, y - \#)$
- Translation UP # Units
 $(x, y) \rightarrow (x, y + \#)$

ROTATIONS about the center (0, 0)

Rule Notation:

- Rotating 90 CW (270 CCW)
 $(x, y) \rightarrow (y, -x)$
- Rotating 180 CW (180 CCW)
 $(x, y) \rightarrow (-x, -y)$
- Rotating 270 CW (90 CCW)
 $(x, y) \rightarrow (-y, x)$
- Rotating 360 CW (360 CCW)
 $(x, y) \rightarrow (x, y)$

ROTATIONS about a Different Center

- ① TRANSLATE
- ② ROTATE
- ③ TRANSLATE BACK

Non-Rigid Transformations: A transformation that does not preserve shape and size

DILATIONS about the center (0, 0)

- Enlargement/Reduction a scale factor of #
 $(x, y) \rightarrow (\#x, \#y)$
- Horizontal stretch/shrink
 $(x, y) \rightarrow (\#x, y)$
- Vertical stretch/shrink
 $(x, y) \rightarrow (x, \#y)$

DILATIONS about a Different Center

- ① TRANSLATE
- ② DILATE
- ③ TRANSLATE BACK

REFLECTIONS

- Reflection Across $y = x$
 $(x, y) \rightarrow (y, x)$
- Reflection Across $y = \#$
Counting Technique
- Reflection Across $x = \#$
Counting Technique
- Reflection Across $y = -x$
 $(x, y) \rightarrow (-y, -x)$

- Reflection Across x-axis or $y = 0$
 $(x, y) \rightarrow (x, -y)$

- Reflection Across y-axis or $x = 0$
 $(x, y) \rightarrow (-x, y)$

$$(x, y) \rightarrow (-x, y)$$

The **IMAGE** is the result of a transformation.

The **PRE-IMAGE** is the figure before the transformation.

Example:
pre-image $(x, y) \rightarrow$ **PRIME** image $(-y, x)$

