

Module 4: Transformations

1

Reflections

- "Flips" over a given line

Example:

Pre-image Image

Think about a mirror image!

2

Rotations

- "Turns" about a point

Example:

Pre-image Image

Think about turning a doorknob!

3

Translations

- "Slides" to a new location

Example:

Pre-image Image

Think about when you slide an object such as a bookcase!

4

Dilations

- "Enlarges" or "reduces" a figure

Example:

Pre-image Image Reduction

Pre-image Image Enlargement

The "pre-image" is the figure before it has undergone a transformation. The "image" is the result of the transformation. We denote the difference between the "pre-image" and "image" when we label our figure. For example,

Points are denoted with capital letters

Pre-image A B C → A' B' C' Image

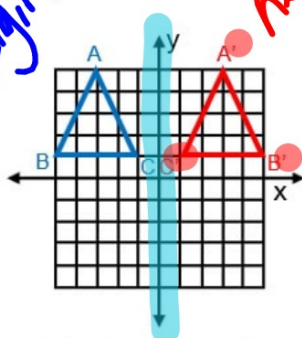
Points have a "prime" symbol now

..eye" dilate bigger or smaller

1

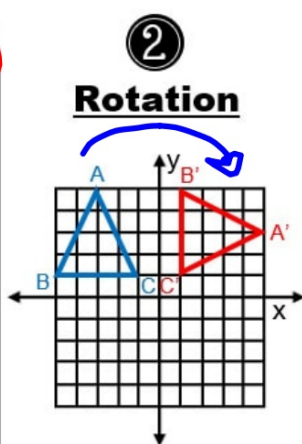
Reflection

define *new*



The pre-image is reflected over the y-axis to create the resulting image.

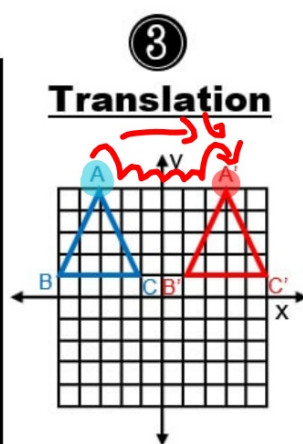
Note – Always make sure to pay very close attention to the label of each point. The pre-image was flipped over the y-axis because the bottom points have changed their position.



The pre-image is rotated 90° clockwise about the origin to create the resulting image.

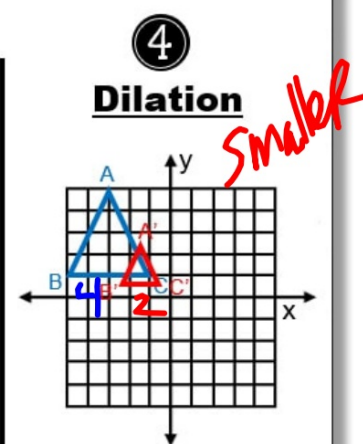
Note – Clockwise moves in the direction of the hands on a clock (Counterclockwise moves in the opposite direction).

c.w. stands for clockwise and c.c.w stands for counterclockwise



The pre-image is shifted to the right 6 units to create the resulting image.

Note – This graph looks very similar to a reflection, but if you pay close attention to the labeling of the points you will see that the points did not change their position.



The pre-image is dilated by a scale factor of $\frac{1}{2}$ to create the resulting image.

Note - The scale factor is denoted with "k".

$$k = \frac{1}{2}$$

A fraction represents a reduction (A whole number would represent an enlargement).

fraction
K-

①

Reflection

Draw the pre-image
then reflect $\triangle ABC$
over the line $y = x$.

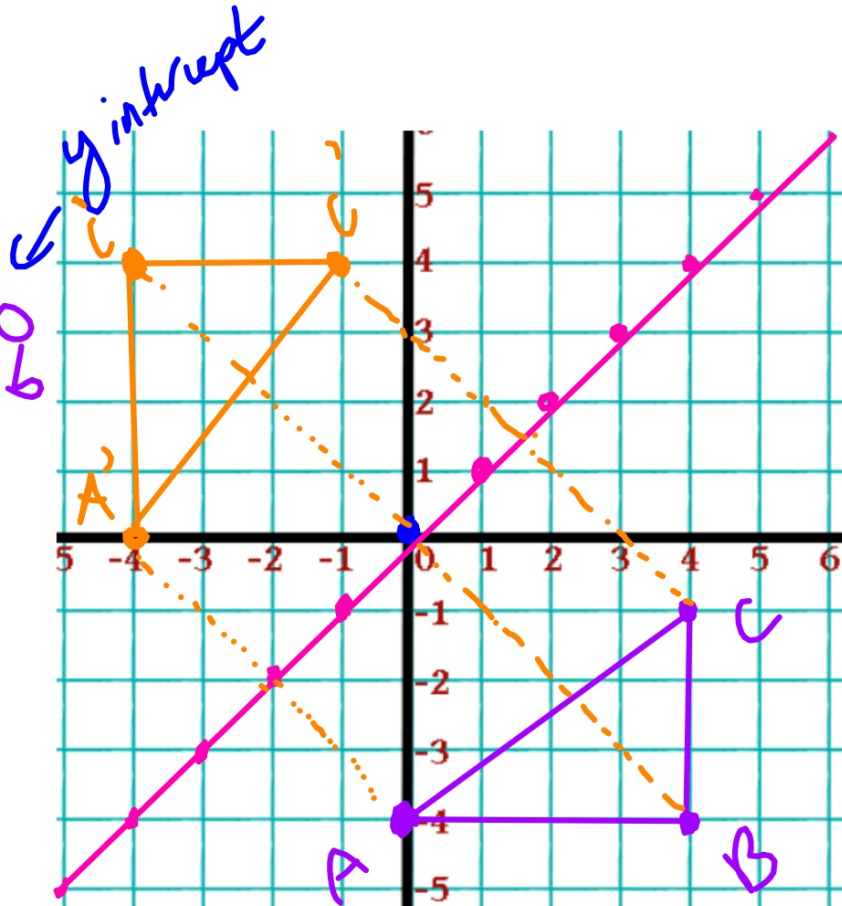
$y = mx + b$
slope

Pre-Image
Coordinates:

A(0,-4)

B(4,-4)

C(4,-1)



②

Rotation

Draw the pre-image

then rotate $\triangle DEF$

90° c.c.w.

Pre-Image

Coordinates:

D(-3,-1) $+1, -3$

E(-4,-4) $+4, -4$

F(-2,-4) $+4, -2$

N(1,1) $-1, 1$

Counterclockwise Rotation	Clockwise Rotation	Coordinate Rule
90° counterclockwise	270° clockwise	$(x, y) \rightarrow (-y, x)$
180° counterclockwise	180° clockwise	$(x, y) \rightarrow (-x, -y)$
270° counterclockwise	90° clockwise	$(x, y) \rightarrow (y, -x)$

1st flip
2nd
change sign

