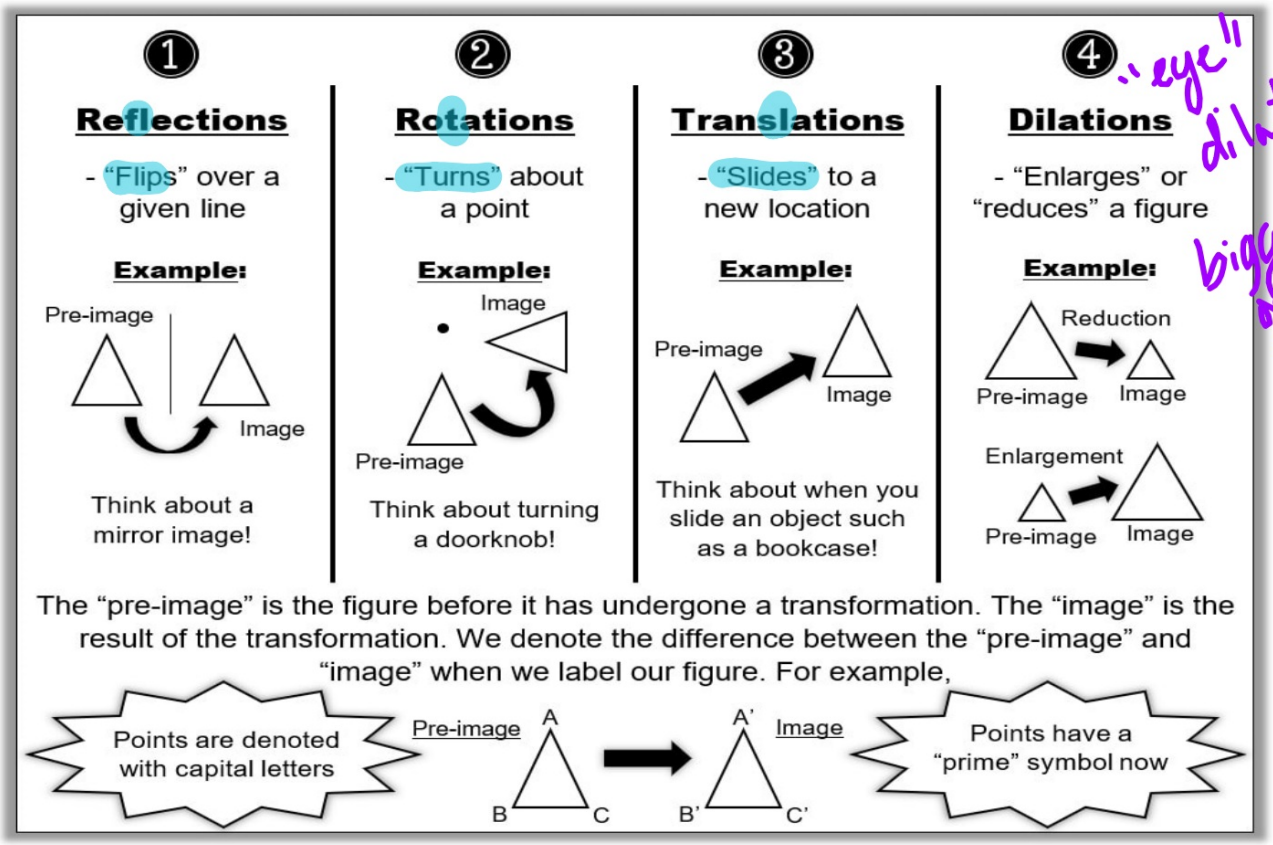
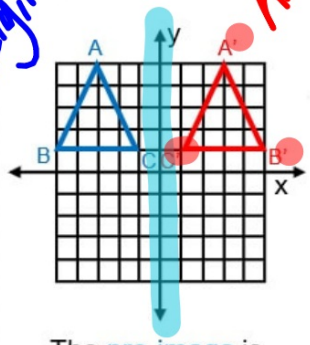
# Module 4: Transformations




"eye" dilate bigger or smaller

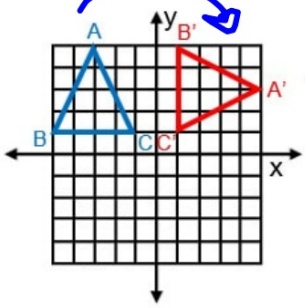
## 1 Reflection




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.

## 2 Rotation

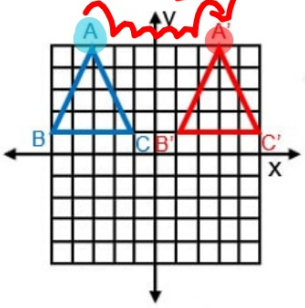



The pre-image is rotated 90° clockwise about the origin to create the resulting image.

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

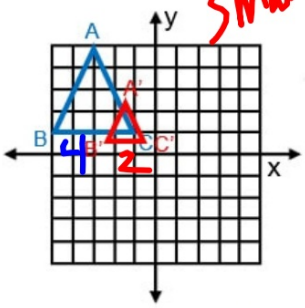
## 3 Translation




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.

## 4 Dilation




The pre-image is dilated by a scale factor of ½ to create the resulting image.

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

k = ½

A fraction represents a reduction

(A whole number would represent an enlargement).

## ❶ Reflection

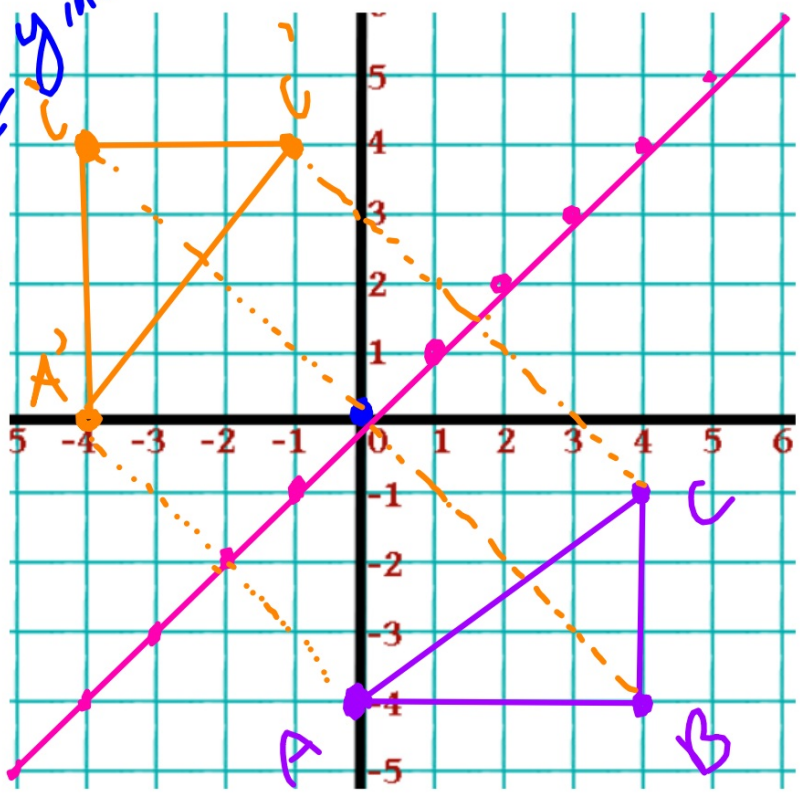
Draw the pre-image then reflect ΔABC over the line y = x.

**Pre-Image Coordinates:**

A(0,-4)

B(4,-4)

C(4,-1)



## ❷ Rotation

Draw the pre-image

then rotate ΔDEF

90° c.c.w.

| 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 the (hom... sign

**Pre-Image Coordinates:**

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

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

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

N(1,1) -1, 1