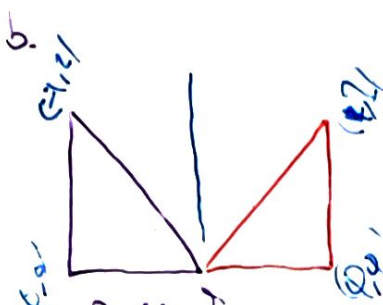


Transformations

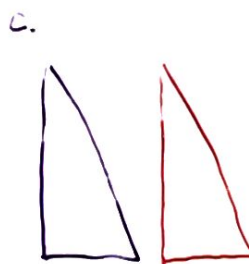
4 types of transformations are:



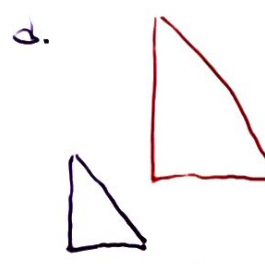
Rotation



Reflection



Translation



Dilation (scale)

$f(x)$	Turns the Pre-image around the axis	Flips the Pre-image and produces the mirror-image	Slides and moves the Pre-image	Stretches or shrinks the Pre-image
Res:	No change on Size or Shape	No change in size or shape or orientation	No change in size or shape; only the direction of the shape	Expands or contracts the shape

Rotation $90^\circ = (x, y) \Rightarrow (-y, x)$

example

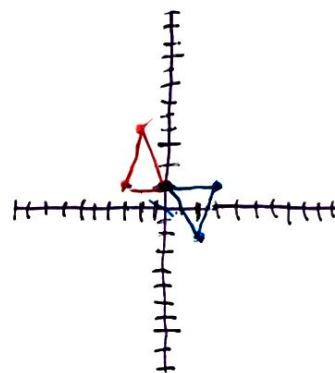
$180^\circ = (x, y) \Rightarrow (-x, -y)$

$(-2, 4) \rightarrow (2, -2)$

$(-3, 1) \rightarrow (3, 1)$

$270^\circ = (x, y) \Rightarrow (y, -x)$

$(0, 1) \rightarrow (1, 0)$



• General Formula for Transformations:

$$f(x) = a(bx - h)^n + k$$

$-f(x) \rightarrow$ Reflect $f(x)$ over the x-axis $\rightarrow (x, -y)$

$f(-x) \rightarrow$ Y-axis $\rightarrow (-x, y)$

$f(x) + a \rightarrow$ Shift $f(x)$ up by a units $\rightarrow (x, y + a)$

$f(x) - a \rightarrow$ down $\rightarrow (x, y - a)$

$f(x + a) \rightarrow$ left $\rightarrow (x - a, y)$

$f(x - a) \rightarrow$ Right $\rightarrow (x + a, y)$

Stretch/Shrink

$a \cdot f(x) \rightarrow$ Vertically $\rightarrow (x, ay)$

$f(ax) \rightarrow$ Horizontally $\rightarrow (x/a, y)$