

# Geometry ch. 9 Transformation Review of Rules

## Translation or shift

$$(x, y) \rightarrow (x+a, y+b)$$

$a$  = amount of shift left or right  
 (-) (+)

$b$  = amount of shift up or down  
 (+) (-)

- vector component form of shift

$$\langle a, b \rangle$$

$a$  = amount you shift in  $x$  direction

$b$  = amount you shift in  $y$  direction

example

$$(x, y) \rightarrow (x+4, y-2)$$

or

$$\langle 4, -2 \rangle$$

$$A(2, 5) \rightarrow A'(6, 3)$$

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

## Reflection

Line of Reflection	Rule
$y$ -axis	$(x, y) \rightarrow (-x, y)$
$x$ -axis	$(x, y) \rightarrow (x, -y)$
$y = x$	$(x, y) \rightarrow (y, x)$
$y = -x$	$(x, y) \rightarrow (-y, -x)$

- All these transformations are isometries  
 image  $\cong$  preimage

A combination of isometries is an isometry

Rotations - rotated counterclockwise about origin

# of degrees	Rule
$90^\circ$	$(x, y) \rightarrow (-y, x)$
$180^\circ$	$(x, y) \rightarrow (-x, -y)$
$270^\circ$	$(x, y) \rightarrow (y, -x)$

## Dilations

$$S.F. = a$$

$$(x, y) \rightarrow (xa, ya)$$