

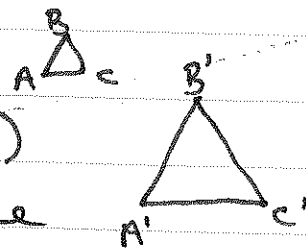
9-1 Translations

Transformations - a change in a geometric figure's position, shape, or size

Pre-image - the original figure (ABC)

Image - the resulting figure ($A'B'C'$)

Isometry - transformation in which the pre-image and image are congruent



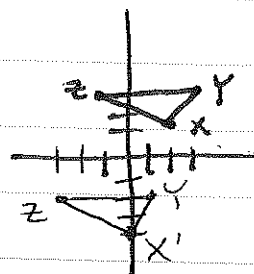
Translation - (or slide)

Ex. 1 Find the image of $\triangle XYZ$ under the translation $(x, y) \rightarrow (x-2, y-5)$.

$$X(2, 1) \rightarrow (2-2, 1-5), \text{ OR } X'(0, -4)$$

$$Y(3, 3) \rightarrow (3-2, 3-5), \text{ OR } Y'(1, -2)$$

$$Z(-1, 3) \rightarrow (-1-2, 3-5), \text{ OR } Z'(-3, -2)$$



Ex. 2 Find the image of $\triangle XYZ$ for the translation $(x, y) \rightarrow (x-4, y+1)$

$$X'(-2, 2), Y'(-1, 4), Z'(-5, 4)$$

Ex. 3 Writing a Rule

Write a rule to describe the translation $PQRS \rightarrow P'Q'R'S'$

$$P(1, -2) \rightarrow P'(-5, -1)$$

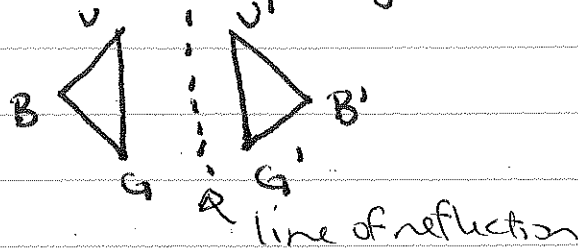
Horizontal change = -4 Vertical change = 1

$$(x, y) \rightarrow (x-4, y+1)$$

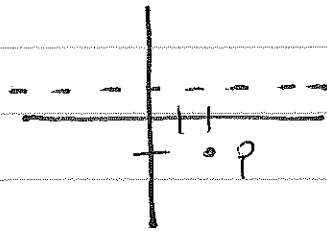
Composition - a combination of two or more transformations

9-2 Reflections

Reflection - (or flip) transformation in which a figure and its image have opposite orientations



Ex. 1 If point $P(2, -1)$ is reflected across the line $y = 1$, what are the coordinates of its reflection image?



$P'(2, 3)$

Ex. 2 What are the coordinates of the images of P if the reflection line is $x = 1$?

$(0, -1)$

Reflection over the given line

x-axis

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

y-axis

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

$y = x$

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