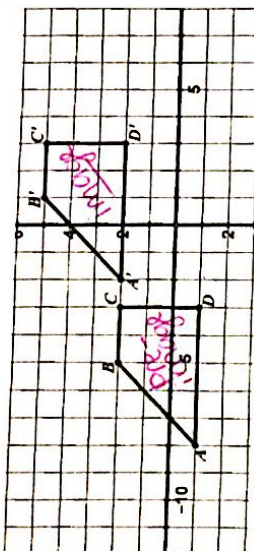


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Per. \_\_\_\_\_

Properties of Translations

1. In the grid below,  $ABCD$  has been transformed to obtain  $A'B'C'D'$ .



' = "prime"  
L' = "L prime"

$ABCD$  is called the **pre-image** and  $A'B'C'D'$  is called the **image**. The pre-image is the figure prior to the transformation and the image is the figure after the transformation.  $A$  and  $A'$ ,  $B$  and  $B'$ ,  $C$  and  $C'$ , and  $D$  and  $D'$  are corresponding vertices.

a. This type of transformation is called a **translation**. Describe in your own words the movement of a figure that has been translated.

Moving left, right, up, down

b. Show on the picture how you would move on the coordinate plane to get from  $A$  to  $A'$ ,  $B$  to  $B'$ ,  $C$  to  $C'$ , and  $D$  to  $D'$ .

right 6, up 3 for each  
 $(x+6, y+3)$   
A to A', B to B', C to C', D to D'

c. In the table below, write the coordinates for the vertices of the pre-image and image.

| Pre-Image     | Image         |
|---------------|---------------|
| A: $(-8, -1)$ | A': $(-2, 2)$ |
| B: $(-5, 2)$  | B': $(1, 5)$  |
| C: $(-3, 2)$  | C': $(3, 5)$  |
| D: $(-3, -1)$ | D': $(3, -1)$ |

right 6, up 3

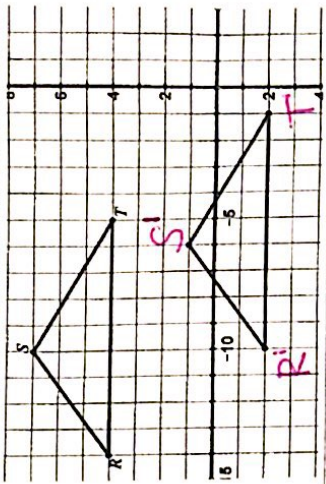
d. The coordinate rule for this translation is  $(x, y) \rightarrow (x + 6, y + 3)$ .

Connect this notation to your answer for part b. and to the coordinates of corresponding vertices in the table.

Original coordinate (pre-image coordinate)

right 6, up 3

2. In the grid below,  $\triangle RST$  has been translated to obtain  $\triangle R'S'T'$ .



a. Label the corresponding vertices of the image on the grid.

b. Describe or show on the picture how you would move on the coordinate plane to get from the vertices in the pre-image to the corresponding vertices in the image.

right 4, down 6

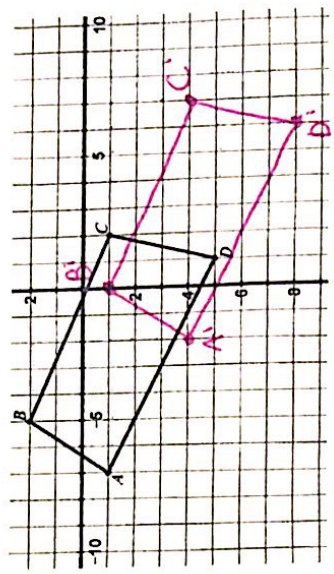
c. In the table below, write the coordinates for the vertices of the pre-image and image.

| Pre-Image      | Image          |
|----------------|----------------|
| R: $(-10, -2)$ | R': $(-6, -2)$ |
| S: $(-4, 4)$   | S': $(0, 4)$   |
| T: $(-4, -2)$  | T': $(0, -2)$  |

$(x, y) \rightarrow (x + 4, y - 6)$

d. Write the coordinate rule that describes this translation.

3. Draw and label the image of the figure below for the translation  $(x, y) \rightarrow (x + 5, y - 3)$ .

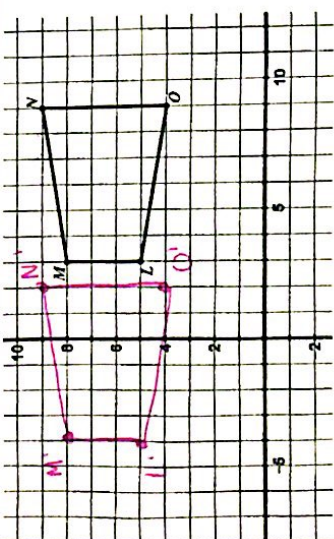


right 5, down 3

x is right/left  
y is up/down

left 7 up 1 down none

4. Draw and label the image of the figure below for the translation  $(x, y) \rightarrow (x - 7, y)$

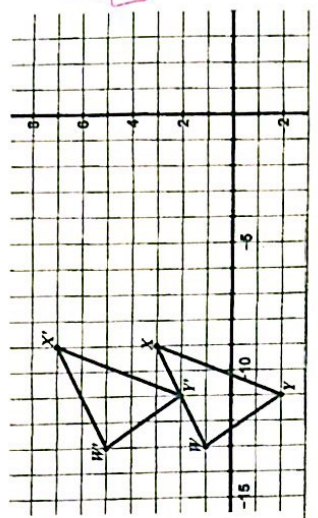


Determine the slopes for:

$MN: \frac{1}{6}$      $M'N': \frac{1}{6}$   
 $NO: \text{undef.}$      $N'O': \text{undef.}$   
 $LO: -\frac{1}{6}$      $L'O': -\frac{1}{6}$   
 $ML: \text{undef.}$      $M'L': \text{undef.}$

left/right, up/down  $(x, y) \rightarrow (x, y+4)$

6. Write a coordinate rule to describe the translation below

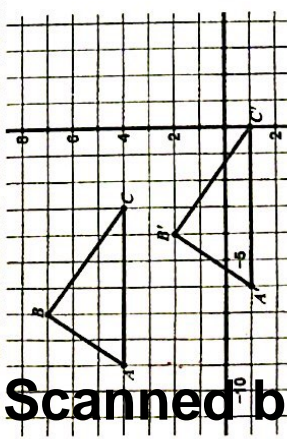


Determine the slopes for:

$WX: \frac{1}{2}$      $W'X': \frac{1}{2}$   
 $XY: \frac{5}{2}$      $X'Y': \frac{5}{2}$   
 $YZ: -\frac{3}{2}$      $Y'Z': -\frac{3}{2}$

5. Write a coordinate rule to describe the translation below.

$(x, y) \rightarrow (x+3, y-5)$



Determine the slopes for:

$AB: \frac{3}{2}$      $A'B': \frac{3}{2}$   
 $BC: -\frac{3}{4}$      $B'C': -\frac{3}{4}$   
 $CA: 0$      $C'A': 0$

right 3, down 5

7. Use questions #1 - 6 to explore some properties of translations and write your observations below.

- \* translations only slide
- \* stays same size and orientation
- \* Slopes stay the same from Pre-image to image.