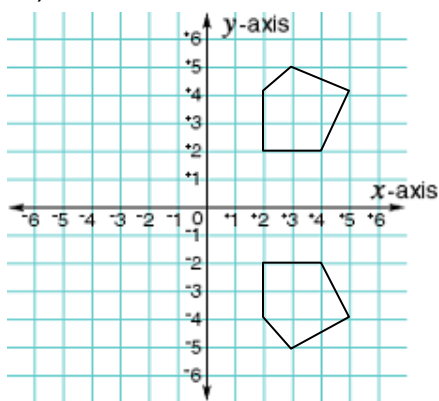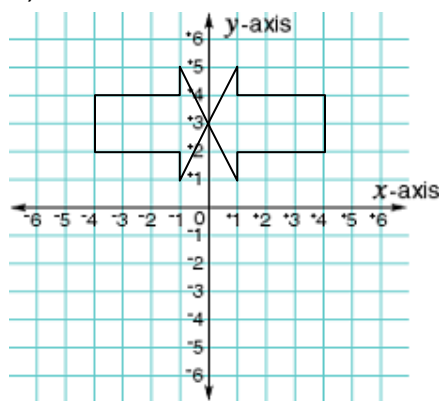Name _____ Period_____ Date_____

Reflections and Symmetry (page 1)

I. A <u>reflection</u> is a transformation in which a figure is reflected, or flipped, over a line, called the <u>line of reflection</u>. Tell whether the transformation is a reflection. If so, identify the line of reflection.
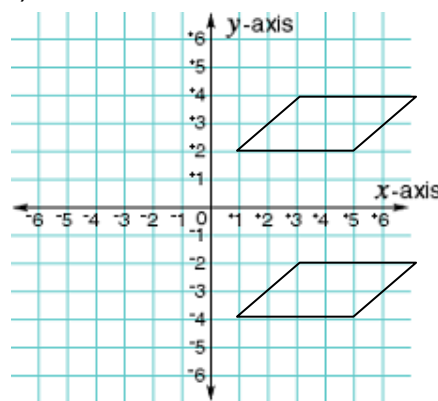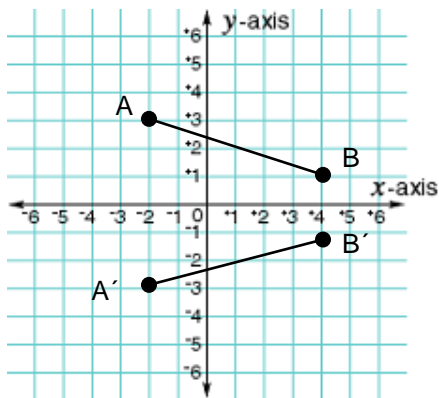
1)

2)

3)

II. You can use coordinate notation to describe the images of figures after reflections. Find the coordinates of A, B, A´, and B´ in both examples. Use this information to write the coordinate notation for

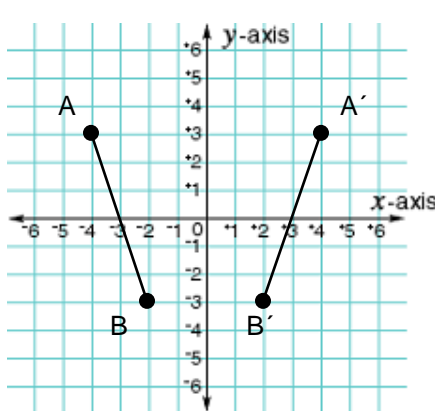**a reflection in the *x*-axis   and   a reflection in the *y*-axis.**

1)

2)

A(,   ) → A´(,   )
B(,   ) → B´(,   )
  (*x* , *y*) → (,   )

A(,   ) → A´(,   )
B(,   ) → B´(,   )
  (*x* , *y*) → (,   )

Reflections and Symmetry (page 2)

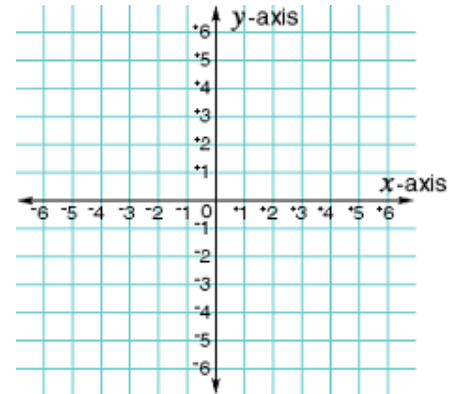**III. An object can be transformed several times and in more than one way.**

1) What are the coordinates of G´ and H´ after $\overline{GH}$ is reflected across the y-axis? Draw and label the image $\overline{G´H´}$.
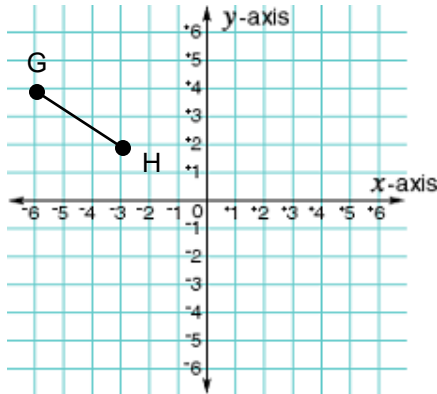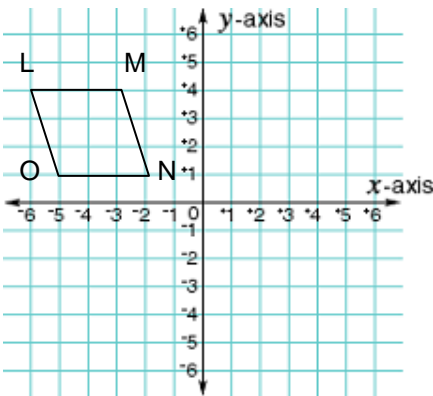
G´ (,   )
H´ (,   )

2) What are the coordinates of A´, B´ and C´ after A, B and C are reflected across the x-axis? Draw the figure and image.

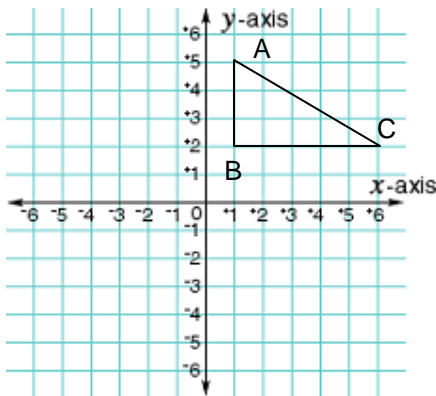$(x , y) \rightarrow$ (,   )
A (1, −1) → A´(,   )
B (3, 2) → B´(,   )
C (4, −3) → C´(,   )

3) Reflect the polygon over the x-axis, then translate using $(x, y) \rightarrow (x + 8, y + 4)$.

4) Reflect the polygon over the y-axis, then translate the image using $(x, y) \rightarrow (x + 1, y − 5)$.

IV. A figure has line <u>symmetry</u> if a line, called the <u>line of symmetry</u>, divides the figure into two parts that are reflections of each other in the line. A figure may have more than one line of symmetry. Tell how many lines of symmetry the following flags have. If they have symmetry, draw the line or lines of symmetry.

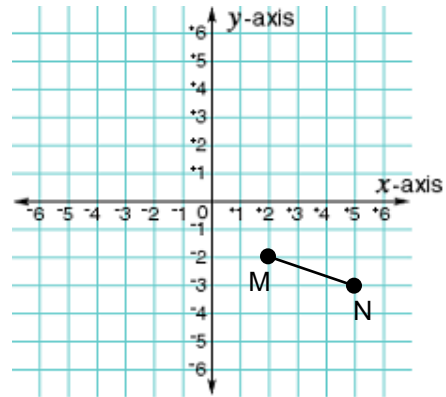# Reflections and Symmetry (page 3)

1) Describe a reflection in one word.

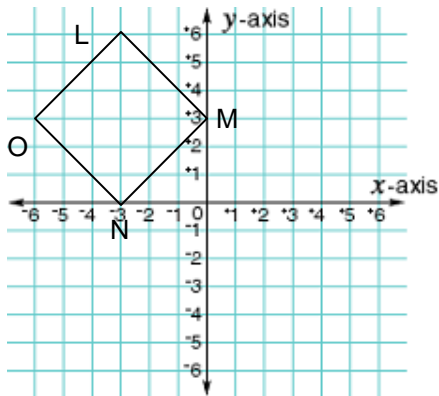**2) What are the coordinates of D´, E´, and F´ after D, E, and F are reflected across the y-axis? Draw the image.**
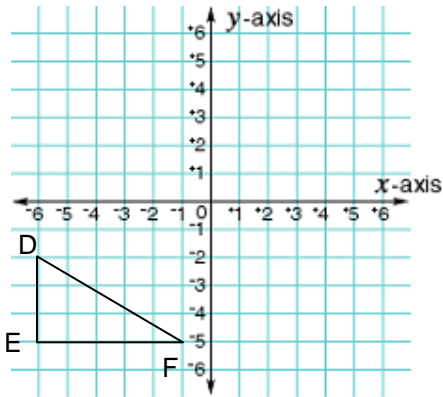
3) What are the coordinates of M´ and N´ after $\overline{MN}$ is reflected across the x-axis? Draw the image.

D (,) → D´ (,)
E (,) → E´ (,)
F (,) → F´ (,)

M (,) → M´ (,)
N (,) → N´ (,)

4) Reflect the polygon in the x-axis, then translate using $(x, y) → (x + 6, y − 1)$.

5) Tell how many lines of symmetry the square below has. Draw them.