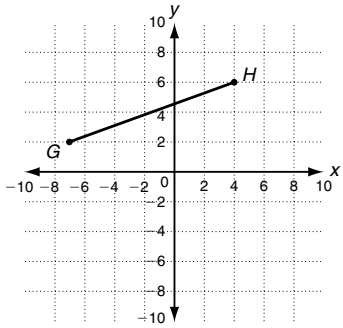
Name _____ Date _____ Class _____

LESSON 4-3

Practice A

Using Matrices to Transform Geometric Figures

Line segment *GH* has endpoints *G*(−7, 2) and *H*(4, 6). Use line segment *GH* for Exercises 1–4.



Use a matrix to transform line segment *GH*. Find the coordinates of the image endpoints *G*' *H*' .

1. Translate 2 units right and 8 units down.

$$\begin{bmatrix} -7 & 4 \\ 2 & 6 \end{bmatrix} + \begin{bmatrix} 2 & 2 \\ -8 & -8 \end{bmatrix}$$

$$= \begin{bmatrix} -7 + 2 & 4 + (\_\_\_\_) \\ (\_\_\_\_) + (\_\_\_\_) & (\_\_\_\_) + (\_\_\_\_) \end{bmatrix}$$

_____

2. Translate 5 units right and 1 unit up.

_____

3. Enlarge by a factor of 8.

$$8\begin{bmatrix} -7 & 4 \\ 2 & 6 \end{bmatrix}$$

$$= \begin{bmatrix} 8(\mathbf{-7}) & 8(\_\_\_\_) \\ \_\_\_\_(\_\_\_\_) & \_\_\_\_(\_\_\_\_) \end{bmatrix}$$

_____

4. Enlarge by a factor of 5.

_____

Use each matrix to reflect the given point. Write the coordinates of the image. Tell which axis the point is reflected across.

5. $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$; (2, −3)

$$\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ -3 \end{bmatrix}$$

$$= \begin{bmatrix} -1(\mathbf{2}) + 0(\_\_\_\_) \\ \_\_\_\_(\_\_\_\_) + \_\_\_\_(\mathbf{-3}) \end{bmatrix}$$

_____

6. $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$; (−10, 1)

_____

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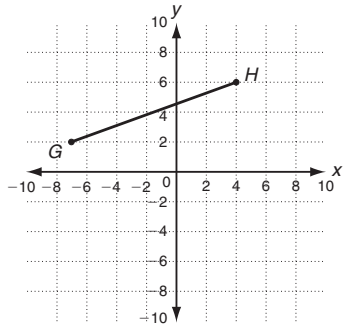
LESSON 4-3

Practice A

Using Matrices to Transform Geometric Figures

Line segment *GH* has endpoints *G*(−7, 2) and *H*(4, 6). Use line segment *GH* for Exercises 1–4.



Use a matrix to transform line segment *GH*. Find the coordinates of the image endpoints *G*' *H*' .

1. Translate 2 units right and 8 units down.

$$\begin{bmatrix} -7 & 4 \\ 2 & 6 \end{bmatrix} + \begin{bmatrix} 2 & 2 \\ -8 & -8 \end{bmatrix}$$

$$= \begin{bmatrix} -7 + 2 & 4 + (\underline{2}) \\ (\underline{2}) + (\underline{-8}) & (\underline{6}) + (\underline{-8}) \end{bmatrix}$$

G′(−5, −6), *H*′(6, −2)

2. Translate 5 units right and 1 unit up.

G′(−2, 3), *H*′(9, 7)

3. Enlarge by a factor of 8.

$$8\begin{bmatrix} -7 & 4 \\ 2 & 6 \end{bmatrix}$$

$$= \begin{bmatrix} 8(\underline{-7}) & 8(\underline{4}) \\ \underline{8}\,(\underline{2}) & \underline{8}\,(\underline{6}) \end{bmatrix}$$

G′(−56, 16), *H*′(32, 48)

4. Enlarge by a factor of 5.

G′(−35, 10), *H*′(20, 30)

Use each matrix to reflect the given point. Write the coordinates of the image. Tell which axis the point is reflected across.

5. $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$; (2, −3)

$$\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ -3 \end{bmatrix}$$

$$= \begin{bmatrix} -1(\underline{2}) + 0(\underline{-3}) \\ \underline{0}\,(\underline{2}) + \underline{1}\,(\underline{-3}) \end{bmatrix}$$

(−2, −3); *y*-axis

6. $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$; (−10, 1)

(−10, −1); *x*-axis