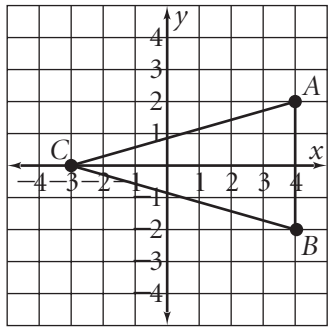
Name _____ Class _____ Date _____

Practice 4-4

Geometric Transformations With Matrices

For Exercises 1–11, use ΔABC at the right. Find the coordinates of the image under each transformation. Express your answer as a matrix.



1. a dilation of 11

2. a translation 1 unit right and 4 units up

3. a dilation of 1.5

4. a translation 2 units right and 6 units down

5. a reflection in $y = x$

6. a rotation of 270°

7. a rotation of 90°

8. a translation 1 unit left and 2 units down

9. a translation 3 units left and 1 unit up

10. a dilation of $\frac{1}{2}$

11. a reflection in the x-axis

Graph each figure and its image after the given transformation.

12. $\begin{bmatrix} 2 & -3 & 6 & 4 \\ 0 & 1 & 1 & -4 \end{bmatrix}$; a dilation of 2

13. $\begin{bmatrix} 8 & 3 & -2 & -5 & 2 \\ 7 & 6 & 1 & 0 & -4 \end{bmatrix}$; a translation 2 units left and 1 unit up

14. $\begin{bmatrix} 2 & 4 & 5 & 3 \\ 1 & 1 & 3 & 5 \end{bmatrix}$; a translation 5 units left and 4 units down

15. $\begin{bmatrix} 2 & 1 & 6 & -4 \\ 0 & -3 & 5 & -2 \end{bmatrix}$; a rotation of 180°

16. $\begin{bmatrix} 6 & 5 & 1 & -3 & 6 \\ -1 & 6 & 2 & 0 & -4 \end{bmatrix}$; a reflection in the y-axis

The coordinates of the vertices of a polygon are given. Represent each transformation with matrices. Then express the coordinates of the vertices of the image as a matrix.

17. $I(21, -14), J(0, -7), K(-14, 0), L(0, 7)$; a dilation of $\frac{1}{7}$

18. $M(2, 0), N(0, -2), P(-2, 0)$; a translation 2 units down

19. $Q(2, 0), R(0, -2), S(-2, 0)$; a reflection in $y = -x$

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