

Name _____

4-6B Lesson Master

Questions on SPUR Objectives

See Student Edition pages 293–297 for objectives.

PROPERTIES Objective F

1. **True or False** A figure and its reflection image are congruent. _____

Matching In 2–4, match the matrix with the reflection.

2. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ _____ 3. $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$ _____ 4. $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ _____

A r_y

B r_x

C $r_{y=x}$

5. According to the Matrix Basis Theorem, if a transformation represented by a 2×2 matrix maps $(1, 0)$ onto (x_1, y_1) and $(0, 1)$ onto (x_2, y_2) , then what is the matrix for the transformation? _____

PROPERTIES Objective G

6. a. Multiply the matrix for $r_{y=x}$ by itself. _____

b. Explain your result.

Fill in the Blanks In 7–9, translate the matrix equation into English.

7. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} -3 \\ 8 \end{bmatrix} = \begin{bmatrix} 8 \\ -3 \end{bmatrix}$ The reflection image of the point _____ over the line _____ is the point _____.

8. $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} -3 \\ 8 \end{bmatrix} = \begin{bmatrix} 3 \\ 8 \end{bmatrix}$ The reflection image of the point _____ over the _____ is the point _____.

9. $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} -3 \\ 8 \end{bmatrix} = \begin{bmatrix} -3 \\ -8 \end{bmatrix}$ The reflection image of the point _____ over the _____ is the point _____.

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page 2

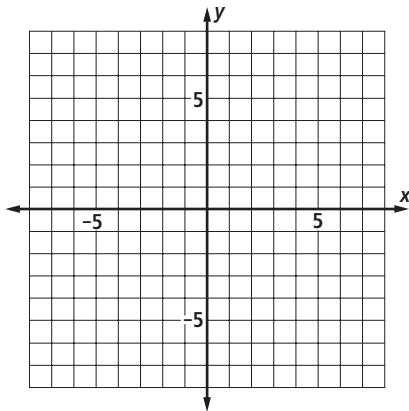
10. a. Multiply the matrix for r_x by $\begin{bmatrix} 2 & 1 & 6 \\ -3 & 0 & 4 \end{bmatrix}$.

b. Multiply the matrix for r_x by your answer to Part a.

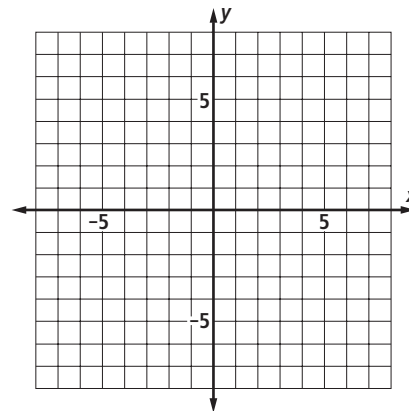
c. Explain your result.

REPRESENTATIONS Objective K

11. A polygon is represented by the matrix $\begin{bmatrix} 1 & -1 & -7 & -3 \\ 5 & 7 & 5 & 1 \end{bmatrix}$. Below graph the polygon and its image under r_y .



12. A polygon is represented by the matrix $\begin{bmatrix} 1 & 6 & 5 \\ 1 & 2 & -2 \end{bmatrix}$. Below graph the polygon and its image under $r_{y=x}$.



In 13–15, give the coordinates of a point that is its own reflection image under the indicated reflection.

13. r_y _____

14. r_x _____

15. $r_{y=x}$ _____