

Name _____

5-5A Lesson Master

Questions on SPUR Objectives
See Student Edition pages 367–371 for objectives.

SKILLS Objective B

In 1–4, for each matrix, find a. the determinant and b. the inverse, if it exists.

1. $\begin{bmatrix} 7 & 5 \\ 4 & 3 \end{bmatrix}$

a. _____

b. _____

2. $\begin{bmatrix} 3 & 1 \\ -2 & 6 \end{bmatrix}$

a. _____

b. _____

3. $\begin{bmatrix} -2 & 10 \\ 1 & -5 \end{bmatrix}$

a. _____

b. _____

4. $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

a. _____

b. _____

In 5 and 6, find a value of x so that the matrix does not have an inverse.

5. $\begin{bmatrix} 3 & 5 \\ 6 & x \end{bmatrix}$ _____

6. $\begin{bmatrix} 9 & 15 \\ x & -4 \end{bmatrix}$ _____

7. The matrix for S_3 is $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$.

a. Find the inverse of this matrix. _____

b. Explain your result geometrically.

8. Use a calculator to find a. the determinant and b. the inverse of $\begin{bmatrix} 3 & 1 & 0 \\ 4 & 5 & 1 \\ 0 & -3 & 1 \end{bmatrix}$.

a. _____

b. _____

9. Melissa receives a message that has been encoded using the matrix

$\begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$ and the key $A = 1, B = 2, \dots, Y = 25, Z = 26, [\text{space}] = 27$. The message she receives is 41, 96, 96, 230, 33, 78, 53, 130, 83, 194, 64, 151, 93, 219, 91, 217.

a. Find the decoding matrix. _____

b. Write the coded message in a 2×8 matrix. _____

c. Multiply your answers to Parts a and b, and decode the message. _____