Unit 6 Day 3 Inverses Assignment Name: _____

1. What is I_4? (Write it)

Find the value of each determinant. Then use it to determine if the matrix has an inverse. Write yes or no.

2. $\begin{vmatrix} -2 & 4 \\ 3 & -6 \end{vmatrix}$

3. $\begin{vmatrix} 3 & 2 \\ 9 & -6 \end{vmatrix}$

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

Use the formula for the inverse of a 2x2 matrix to find the inverse of each matrix:

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

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

7. $\begin{bmatrix} -2 & 1 \\ 1 & -4 \end{bmatrix}$

7. Use augmented matrices and row operations to find the inverse of $\begin{bmatrix} 1 & -3 \\ -1 & 4 \end{bmatrix}$

To find the inverse of a 3 x 3 matrix, use desmos.com/matrix and the A^{-1} button, or on a graphing calculator, store the original matrix, then use the x^{-1} button.

Use technology to find each inverse:

8. $\begin{bmatrix} 5 & 1 & -4 \\ 0 & -3 & -6 \\ -1 & -1 & -1 \end{bmatrix}$

9. $\begin{bmatrix} 2 & 1 & 8 \\ 1 & -1 & 1 \\ 3 & -2 & -2 \end{bmatrix}$

10. $\begin{bmatrix} 6 & 3 & -3 \\ 6 & 1 & 4 \\ 0 & 0 & 5 \end{bmatrix}$

For problems 11 – 14, use this matrix: M = $\begin{bmatrix} -1 & 4 & 2 \\ 2 & -7 & -3 \\ 3 & -12 & -5 \end{bmatrix}$

11. Find the additive identity for M.

12. Find the additive inverse for M.

13. Find the multiplicative identity for M.

14. Find the multiplicative inverse for M.

Solve each system using inverse matrices. Do the first two by hand, then use technology to find the inverse.

15. $\begin{cases} 2x + y = 10 \\ -2x - 2y = -16 \end{cases}$

16. $\begin{cases} 10x - 18y = -12 \\ -3x + 9y = 18 \end{cases}$

17. $\begin{cases} -16x + 8y = -24 \\ 8x - 2y = 2 \end{cases}$

18. $\begin{cases} -28x - 14y = 26 \\ -24x - 12y = 24 \end{cases}$

19. $\begin{cases} x - 4y - 6z = 14 \\ 3x - 6y = -12 \\ 6x - 4y - z = 4 \end{cases}$

20. $\begin{cases} 3x + 3y - 2z = -11 \\ -2x - y + 4z = 4 \\ y + 3z = -3 \end{cases}$