Pre-Calculus Unit 1 Study Guide

I CAN apply matrix operations.

Determine the order of each matrix.

1. $\begin{bmatrix} -1 & 3 & 5 \\ 0 & -9 & 4 \end{bmatrix}$

2. $\begin{bmatrix} 1 \\ 5 \\ 9 \end{bmatrix}$

Find (a) A + B, (b) A – B, (c) 3A, and (d) 2A – 3B.

3. $A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & -2 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 0 & -1 & -1 \\ -2 & 2 & 5 \end{bmatrix}$

Use the definition of matrix multiplication to find (a) AB and (b) BA. (Show your work)

4. $A = \begin{bmatrix} 1 & -1 \\ 2 & 0 \end{bmatrix}$ $B = \begin{bmatrix} 3 & -2 \\ 1 & 4 \end{bmatrix}$

5. $A = \begin{bmatrix} 4 & 2 \\ -1 & -3 \\ 2 & -1 \end{bmatrix}$ $B = \begin{bmatrix} -2 & 2 & 0 \end{bmatrix}$

Solve for a and b.

6. $\begin{bmatrix} 2 & -1 \\ 4a - 3 & -3 \\ 4 & 19 \end{bmatrix} = \begin{bmatrix} 2 & -1 \\ -19 & -3 \\ 4 & 15b - 4 \end{bmatrix}$

7. $\begin{bmatrix} 17 & 3 & -22 \\ 6b - 2 & 3 & -16 \end{bmatrix} = \begin{bmatrix} 17 & -2a + 13 & -22 \\ -32 & 3 & -16 \end{bmatrix}$

Find the determinant and inverse of the matrix if it has one, or state the inverse does not exist.

8. $\begin{bmatrix} 3 & -4 \\ -2 & 3 \end{bmatrix}$

9. $\begin{bmatrix} -6 & 3 \\ 7 & -4 \end{bmatrix}$

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

11. **Are the following matrices Inverses?**

$$\begin{bmatrix} -1 & -2 \\ 3 & 4 \end{bmatrix} \qquad \begin{bmatrix} 2 & 1 \\ -1.5 & -0.5 \end{bmatrix}$$

Perform the indicated elementary row operation on the matrix.

$$\begin{bmatrix} 4 & -2 & 3 & 2 \\ 1 & 0 & 2 & 3 \\ -5 & 6 & 2 & 1 \end{bmatrix}$$

12. R_{12}

13. $R_1 + R_2$

14. $(-3)R_3 + R_1$

15. $\left(\frac{1}{3}\right)R_2$

Solve the system of equations by finding the reduced row echelon form.

16. $3x - 5y = 25$
    $2x + 4y = 24$

17. $x + y + z = 2$
    $2x + 3y + z = 7$

I CAN solve a system of equations using inverse matrices.

Solve the system of equations by using an inverse matrix.

18. $4x - 6y = 1$
    $3x - 5y = 5$

19. $x - 5y + 3z = 2$
    $2x - 3y - z = 1$
    $-2x + 2y + z = 12$

I CAN solve systems of linear equations using inverse matrices.

At Philip's convenience store the total cost of one medium and one large soda is $1.74. The large soda costs $0.16 more than the medium soda. What is the cost of each size of soda?

Write a matrix equation and use the inverse to solve.

A 5-lb nut mixture is worth $2.80 per pound. The mixture contains peanuts worth $1.70 per pound and cashews worth $4.55 per pound. How many pounds of each type of nut are in the mixture? Write a system of equation and solve using inverses. Then solve using RREF.