COLLEGE ALGEBRA
MATH 1314
CHAPTER 6 EXAMINATION REVIEW
Name_____

SHOW ALL OF YOUR WORK AND CIRCLE YOUR ANSWERS.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Write an augmented matrix for the system of equations.

1) $\begin{aligned} 6x + 9y + 2z &= 53 \\ 3x + 9y + 4z &= 43 \\ 2x + 9y + 4z &= 41 \end{aligned}$

A) $\left[\begin{array}{ccc|c} 53 & 2 & 9 & 6 \\ 43 & 4 & 9 & 3 \\ 41 & 4 & 9 & 2 \end{array}\right]$ B) $\left[\begin{array}{ccc|c} 6 & 3 & 2 & 53 \\ 9 & 9 & 9 & 43 \\ 2 & 4 & 4 & 41 \end{array}\right]$ C) $\begin{bmatrix} 6 & 9 & 2 \\ 3 & 9 & 4 \\ 2 & 9 & 4 \end{bmatrix}$ D) $\left[\begin{array}{ccc|c} 6 & 9 & 2 & 53 \\ 3 & 9 & 4 & 43 \\ 2 & 9 & 4 & 41 \end{array}\right]$

Use Gauss–Jordan elimination.

2) $\begin{aligned} x - y + 4z &= -5 \\ 3x + z &= -1 \\ x + 2y + z &= 1 \end{aligned}$

A) {(–1, 1, 0)} B) {(0, 1, –1)} C) ∅ D) {(–1, 0, 1)}

Use Gaussian elimination to find the complete solution to the system of equations, or state that none exists.

3) $\begin{aligned} 4x - y + 3z &= 12 \\ x + 4y + 6z &= -32 \\ 5x + 3y + 9z &= 20 \end{aligned}$

A) {(–8, –7, 9)} B) {(2, –7, –1)} C) {(8, –7, –2)} D) ∅

4) $\begin{aligned} 3x + y + z - 2w &= 10 \\ 2x + 3y + 3z + w &= -5 \\ 2x + y + 4z + 11w &= 11 \end{aligned}$

A) {(7, –1, –6, 2)} B) {(6, –4, –2, 1)}

C) {(2t + 3, 6t – 7, –10t + 8, t)} D) {(t + 5, 3t – 7, –4t + 2, t)}

Perform the indicated matrix operations.

5) Let $A = \begin{bmatrix} -1 & 3 \\ 0 & 4 \\ 8 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 2 \\ 17 & 4 \\ 4 & 2 \end{bmatrix}$. Find A – B.

A) $\begin{bmatrix} 3 & -2 \\ 7 & 0 \\ -4 & 6 \end{bmatrix}$ B) $\begin{bmatrix} -8 & 1 \\ -17 & 0 \\ 4 & -6 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 1 \\ 7 & 0 \\ 4 & -2 \end{bmatrix}$ D) $\begin{bmatrix} 1 & 4 \\ 7 & 8 \\ 12 & 1 \end{bmatrix}$

Find the product, AB, if possible.

6) $A = \begin{bmatrix} 2 & 6 & 2 \\ -2 & 6 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -4 \\ -9 \\ -1 \end{bmatrix}$

A) $\begin{bmatrix} -64 & -47 \end{bmatrix}$ B) $\begin{bmatrix} -64 \\ -47 \end{bmatrix}$ C) AB is not defined. D) $\begin{bmatrix} 2 & 6 & 2 \\ -2 & 6 & 1 \\ -4 & -9 & -1 \end{bmatrix}$

Find the inverse of the matrix.

7) $A = \begin{bmatrix} 1 & 0 & 0 \\ -4 & 1 & 0 \\ 0 & -5 & 1 \end{bmatrix}$

A) $\begin{bmatrix} 1 & 0 & 0 \\ -4 & 1 & 0 \\ 0 & 0 & -5 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 0 & 0 \\ -5 & -1 & 0 \\ -20 & -4 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 1 & -5 & -20 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix}$ D) $\begin{bmatrix} 1 & 0 & 0 \\ 4 & 1 & 0 \\ 20 & 5 & 1 \end{bmatrix}$

Solve the system using the inverse of the coefficient matrix.

8) $\begin{aligned} x + 2y + 3z &= 2 \\ x + y + z &= 10 \\ 2x + 2y + z &= -8 \end{aligned}$ The inverse of $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 1 \\ 2 & 2 & 1 \end{bmatrix}$ is $\begin{bmatrix} -1 & 4 & -1 \\ 1 & -5 & 2 \\ 0 & 2 & -1 \end{bmatrix}$.

A) {(8, −20, −8)} B) {(46, −64, 28)} C) {(34, 36, 12)} D) {(8, −58, 30)}

Use Cramer's rule to solve the system or to determine that the system is inconsistent or contains dependent equations.

9) $\begin{aligned} 3x + 2y &= 11 \\ 2x - 3y &= 3 \end{aligned}$

A) {(3, 1)} B) {(−3, −1)} C) {(−1, 3)} D) {(1, 3)}

Evaluate the determinant.

10) $\begin{vmatrix} 0 & 0 & 0 & 2 \\ 6 & 1 & 7 & 8 \\ 8 & 9 & 1 & 6 \\ 5 & 1 & 4 & 4 \end{vmatrix}$

A) −2 B) −152 C) −8 D) 152