Unit 7 Review Name Key Per ___

Intro Precalculus

#1 – 3: Identify the number of solutions for each system. If the system has at least one solution, then solve.

1) $\left[\begin{array}{ccc|c} 1 & -2 & 1 & 5 \\ 0 & 1 & 4 & 7 \\ 0 & 0 & 0 & 0 \end{array}\right]$

1 MS

$(\cancel{19+9z}, 7-4z, z)$

$19-9z$

2) $\left[\begin{array}{ccc|c} 1 & 3 & -1 & 11 \\ 0 & 1 & 2 & 16 \\ 0 & 0 & 1 & 4 \end{array}\right]$

$(-9, 8, 4)$

3) $\left[\begin{array}{ccc|c} 1 & -3 & 2 & 2 \\ 0 & 1 & 9 & -1 \\ 0 & 0 & 0 & 6 \end{array}\right]$

no solution

#4 – 7: Use any strategy to write each matrix in row-echelon form. Then give the solution to the system.

4) $\begin{cases} x+y+z=4 \\ x-y-z=0 \\ x-y+z=2 \end{cases}$

$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 4 \\ 0 & 1 & 1 & 2 \\ 0 & 0 & 1 & 1 \end{array}\right]$

$(2, 1, 1)$

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

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$\left[\begin{array}{ccc|c} 1 & 2 & -1 & -1 \\ 0 & 1 & -2/3 & -5/3 \\ 0 & 0 & 1 & 1 \end{array}\right]$

$(2, -1, 1)$

6) $\begin{cases} 2x-2y+2z=5 \\ x-y+z=2 \\ 2x+y-z=1 \end{cases}$

$\left[\begin{array}{ccc|c} 1 & -1 & 1 & 5/2 \\ 0 & 1 & -1 & -4/3 \\ 0 & 0 & 0 & 1 \end{array}\right]$

no solution

7) $\begin{cases} x-3y+z=1 \\ -2x+y+3z=-7 \\ x-4y+2z=0 \end{cases}$

$\left[\begin{array}{ccc|c} 1 & -1/2 & -3/2 & 7/2 \\ 0 & 1 & -1 & 1 \\ 0 & 0 & 0 & 0 \end{array}\right]$

Infinitely many

$(4+2z, 1+z, z)$

#8 – 13: Perform the indicated operation, if possible, using the matrices below:

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

8) $2A-D$

$$\begin{bmatrix}6 & -5 & 3\\ 7 & 8 & -6\end{bmatrix}$$

9) $D+3A$

$$\begin{bmatrix}4 & 0 & 7\\ 18 & 7 & 1\end{bmatrix}$$

10) CB

$$\begin{bmatrix}9 & -13\\ 5 & -6\\ 7 & 1\end{bmatrix}$$

11) AB

$$\begin{bmatrix}-1 & -16\\ 8 & 1\end{bmatrix}$$

12) BC

$3\times 2 \quad 3\times 3$

not possible

13) DB

$$\begin{bmatrix}10 & 5\\ -2 & -30\end{bmatrix}$$

#14 – 15: Find the values of x, y, and z so that the following matrices are equal.

14) $\begin{bmatrix}2x & y+7\\ z & 4\end{bmatrix}=\begin{bmatrix}-10 & 13\\ 6 & 4\end{bmatrix}$

$x=-5$
$y=6$
$z=6$

15) $3\begin{bmatrix}x & 2y-1\\ z & 3\end{bmatrix}=\begin{bmatrix}-12 & 21\\ 27 & 9\end{bmatrix}$

$x=-4$
$y=4$
$z=9$

#16 – 17: Solve each system by using the multiplicative inverse. set up the matrix equation!

16) $\begin{cases}3x+5y=9\\ 2x-3y=-13\end{cases}$

$$\begin{bmatrix}3 & 5\\ 2 & -3\end{bmatrix}\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}9\\ -13\end{bmatrix}$$

$$\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}3/19 & 5/19\\ 2/19 & -3/19\end{bmatrix}\begin{bmatrix}9\\ -13\end{bmatrix}$$

$$\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}-2\\ 3\end{bmatrix}$$

17) $\begin{cases}7x+2y=0\\ 2x+y=-3\end{cases}$

$$\begin{bmatrix}7 & 2\\ 2 & 1\end{bmatrix}\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}0\\ -3\end{bmatrix}$$

$$\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}1/3 & -2/3\\ -2/3 & 7/3\end{bmatrix}\begin{bmatrix}0\\ -3\end{bmatrix}$$

$$\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}2\\ -7\end{bmatrix}$$