Name_____

Date_____

Advanced Algebra

Unit 6: I can solve a Matrix to System.

Assignment #13

You should use your answers and work from yesterday Assignment # 12

$$[A]^{-1}*[A]*\begin{bmatrix} a & b \\ c & d \end{bmatrix}=[A]^{-1}*[B]$$

$$\text{Therefore } \begin{bmatrix} a & b \\ c & d \end{bmatrix}=[A]^{-1}*[B]$$

So the KEY point to solving a matrix system is I need to know the Inverse Matrix. Then I am multiplying the inverse on both sides. The result is then getting the variable matrix by itself and multiplying two matricies on the other side. The result is the answer to the system.

1) $\begin{bmatrix} 3 & -9 \\ -1 & 4 \end{bmatrix}\begin{bmatrix} a & b \\ c & d \end{bmatrix}=\begin{bmatrix} 24 & -78 \\ -10 & 36 \end{bmatrix}$

So $\begin{bmatrix} \frac{4}{3} & 3 \\ \frac{1}{3} & 1 \end{bmatrix} \cdot \begin{bmatrix} 24 & -78 \\ -10 & 36 \end{bmatrix}$

a= 2	b= 4
c= -2	d= 10

2) $\begin{bmatrix} 1 & -2 \\ 2 & 1 \end{bmatrix}\begin{bmatrix} a & b \\ c & d \end{bmatrix}=\begin{bmatrix} -8 & 4 \\ -1 & 13 \end{bmatrix}$

So $\begin{bmatrix} \frac{1}{5} & \frac{2}{5} \\ \frac{-2}{5} & \frac{1}{5} \end{bmatrix} \cdot \begin{bmatrix} -8 & 4 \\ -1 & 13 \end{bmatrix}$

a= -2	b= 6
c= 3	d= 1

3) $\begin{bmatrix} 3 & 2 \\ 5 & -4 \end{bmatrix}\begin{bmatrix} a & b \\ c & d \end{bmatrix}=\begin{bmatrix} 24 & 70 \\ -70 & -30 \end{bmatrix}$

So $\begin{bmatrix} \frac{4}{22} & \frac{2}{22} \\ \frac{5}{22} & \frac{-3}{22} \end{bmatrix} \begin{bmatrix} 24 & 70 \\ -70 & -30 \end{bmatrix}$

a= -2	b= 10
c= 15	d= 20

4) $\begin{bmatrix}3 & 2\\ 9 & -5\end{bmatrix}\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}-1 & 4\\ -47 & -43\end{bmatrix}$

$\begin{bmatrix}a & b\\ c & d\end{bmatrix}$ so $= \begin{bmatrix}\frac{5}{33} & \frac{2}{33}\\ \frac{9}{33} & \frac{-3}{33}\end{bmatrix}\begin{bmatrix}-1 & 4\\ -47 & -43\end{bmatrix}$

(4) a= -3 b= -2 c= 4 d= 5

5) $\begin{bmatrix}5 & -4\\ 1 & 3\end{bmatrix}\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}5 & 30\\ -18 & -32\end{bmatrix}$

$\begin{bmatrix}a & b\\ c & d\end{bmatrix}$ so $= \begin{bmatrix}\frac{3}{19} & \frac{4}{19}\\ \frac{-1}{19} & \frac{5}{19}\end{bmatrix}\begin{bmatrix}5 & 30\\ -18 & -32\end{bmatrix}$

(5) a= -3 b= -2 c= -5 d= -10

6) $\begin{bmatrix}4 & -3\\ 7 & 12\end{bmatrix}\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}-5 & -4\\ 43 & 62\end{bmatrix}$

$\begin{bmatrix}a & b\\ c & d\end{bmatrix}$ so $= \begin{bmatrix}\frac{12}{69} & \frac{3}{69}\\ \frac{-7}{69} & \frac{4}{69}\end{bmatrix}\begin{bmatrix}-5 & -4\\ 43 & 62\end{bmatrix}$

(6) a= 1 b= 2 c= 3 d= 4

7) $\begin{bmatrix}3 & 4\\ -2 & 3\end{bmatrix}\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}-27 & 58\\ 40 & 18\end{bmatrix}$

$\begin{bmatrix}a & b\\ c & d\end{bmatrix} = \begin{bmatrix}\frac{3}{17} & \frac{-4}{17}\\ \frac{8}{17} & \frac{-3}{17}\end{bmatrix}\begin{bmatrix}-27 & 58\\ 40 & 18\end{bmatrix}$

(7) a= -14.2 b= 6 c= -10.2 d= 3.6

8) $\begin{bmatrix}5 & -2\\ 4 & 3\end{bmatrix}\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}4 & 52\\ -6 & 36\end{bmatrix}$

$\begin{bmatrix}a & b\\ c & d\end{bmatrix} = \begin{bmatrix}\frac{3}{23} & \frac{2}{23}\\ \frac{-4}{23} & \frac{5}{23}\end{bmatrix}\begin{bmatrix}4 & 52\\ -6 & 36\end{bmatrix}$

(8) a= b= c= d=

9) $\begin{bmatrix}7 & 2\\ 3 & -5\end{bmatrix}\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}13 & 22\\ -12 & -14\end{bmatrix}$

$\begin{bmatrix}a & b\\ c & d\end{bmatrix} = \begin{bmatrix}\frac{5}{41} & \frac{2}{41}\\ \frac{3}{41} & \frac{-7}{41}\end{bmatrix}\cdot\begin{bmatrix}13 & 22\\ -12 & -14\end{bmatrix}$

(9) a= b= c= d=