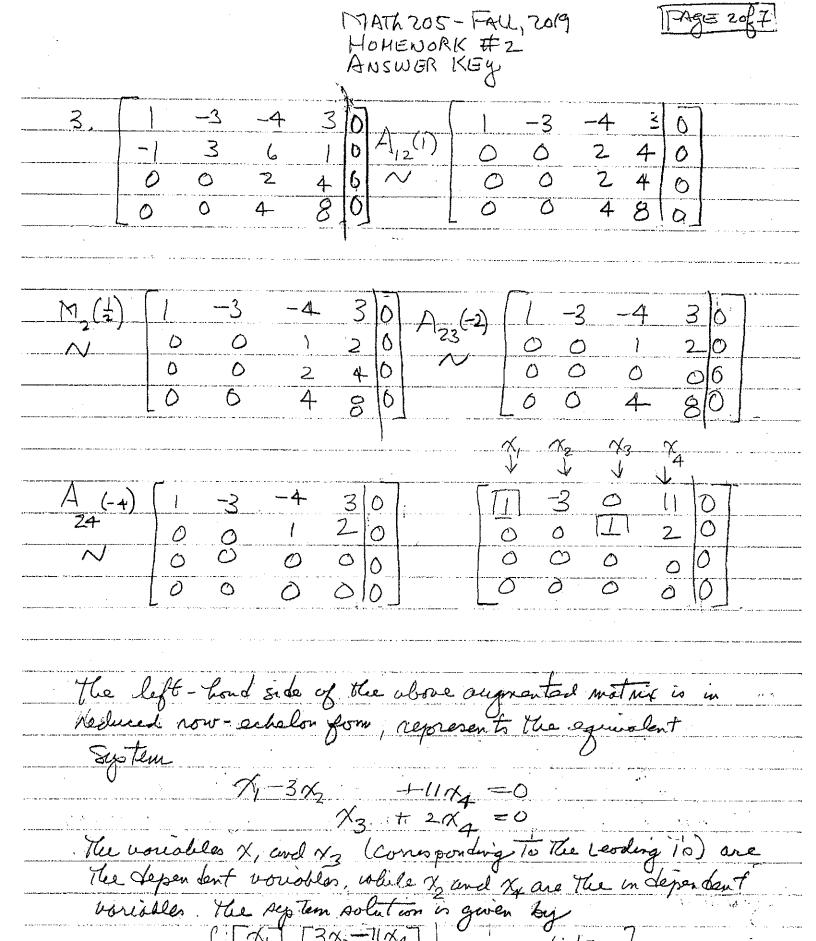
$$\begin{bmatrix}
1 & 3 & 3 & 4 \\
1 & 4 & 3 & 2 \\
1 & 3 & 4 & 6
\end{bmatrix}$$

$$A_{12}(-1)
\begin{bmatrix}
1 & 3 & 3 & 4 \\
0 & 1 & 0 & -2 \\
1 & 3 & 4 & 6
\end{bmatrix}$$

2. The system is consistent (with unique solution 
$$\begin{bmatrix} z_1 \\ z_2 \end{bmatrix} = \begin{bmatrix} 4 \\ -2 \\ 2 \end{bmatrix}$$
).



4. Note: For 2x2 Matrices there is an easy way to get the invent:

If M= [a b] Then M= ad-be [c a]

Note that M'exist precisely when ad-60 + 0.

So,  $\begin{bmatrix} 1 & -3 \\ -2 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 2 & 3 \\ 1(2) - (3)(-1) & 2 & 1 \end{bmatrix}$ 

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

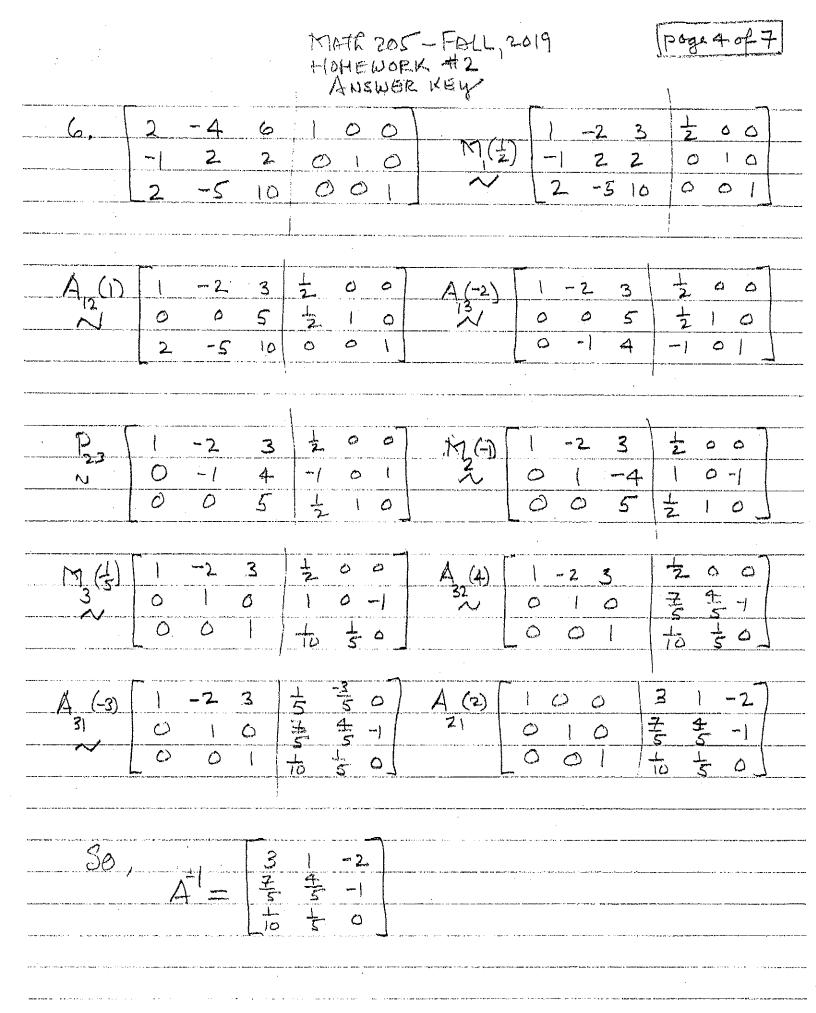
 $= \begin{bmatrix} 7 & -9 \\ -6 & 10 \end{bmatrix} - \begin{bmatrix} 3 & -9 \\ -6 & 6 \end{bmatrix} - \begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ 

- [00

\* Note: This easy way is nothing more than Taking an orbitary 2x2 matrix, augmenting it by the 2x2 identity matrix Iz and reducing via a now operations. (cf., problem #9).

[a b 10] ~ [10 ad-bc ad-bc]
c d 01.] ~ [0 + ad-bc ad-bc]

= ad-bc [d -b]



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poge 60 7

7. The matrix equation for the indicated oystem in (7)  $A\pi = 0$ , where  $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 - 2 \end{bmatrix} = \begin{bmatrix} \chi_1 \\ \chi_2 \end{bmatrix} = \begin{bmatrix} \alpha^2 \\ \alpha^2 \end{bmatrix}$ The Austern in consistant if for any choice of C. There is an  $\pi = \begin{bmatrix} \pi \\ \pi_2 \end{bmatrix}$  that police (4). This cortainly is Ame when A exist for them  $\alpha = A' \overline{a}$ . But A does exist in this case series A con be reduced to the identity as follows:  $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & -2 \end{bmatrix} A_{12}(-2) \begin{bmatrix} 1 & 2 & 3 \\ 0 & -5 & -8 \end{bmatrix} \\ -1 & -7 & -1 \end{bmatrix}$  $A_{32}(8)$  | 2 0 | A<sub>31</sub>(-3) | 0 0 1

A2,(-2) 100 N 010

30, any choice of a yields a consistant system

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10- To find A, we augment A with the 3x3 clarity motrix, Is. Then use elementary now operations to Transform A into the 3x3 identity - This Transforms
Is into A!

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	The state of the s		<u> </u>	3	3	100	A(-D)	{	3	3	1	0 0	
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Ma Madala and a service of the servi	A (-1)		3	3	1	0	٥	A (-3)		3	0	4	0	-3	\
*******	13	0	1	0	- }	{	٥	31	0	1	0	-	1	0	
<u> </u>	$\sim$	0	٥	. 1	-1	0		~/	C	0	1	-1	0		
			-		}										**

A(-3)		0	0	7	-3	-3
21	0	l	0	-1	1	0
$\sim$	0	0		-1	0	

and we have the (unique) solution to the given pystom

[x] = A-1 [0] = [7] = [-3]