PreCalculus Review Lesson & Assignment 1

Tuesday, 3/17 (A) and Wednesday, 3/18 (B)

Review Lesson:

Pull up Notes 6-2 and click on the link for the online matrix calculator.

https://www.meta-calculator.com/matrix-calculator.php

Click *START CALCULATOR*.

Notes 6-2 Example 1

Solve the system of equations:

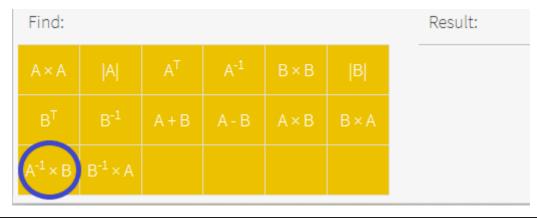$$\begin{cases} 3x + y - z = 0 & (1) \\ 2x + z - 4 = 0 & (2) \\ y + 2z - 7 = 0 & (3) \end{cases}$$

In order to find the solution of this system using matrices, we must make sure all our equations are in standard form. Using basic algebra, we come up with:
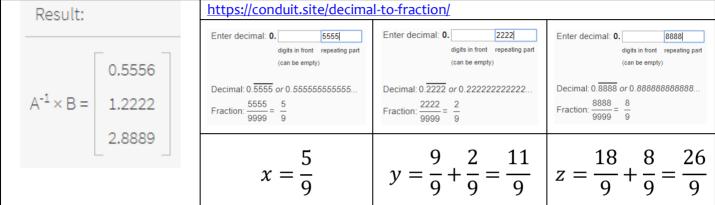
$$\begin{cases} 3x + y - z = 0 \\ 2x + 0y + z = 4 \\ 0x + y + 2z = 7 \end{cases}$$

Matrices A (3x3) and B (3x1) can now be entered in the online matrix calculator.

Matrix A: 3 ▾ rows	3 ▾ cols				Matrix B: 3 ▾ rows	1 ▾ cols			
3	1	-1	0	0	0	0	0	0	0
2	0	1	0	0	4	0	0	0	0
0	1	2	0	0	7	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

We will now multiply the inverse of matrix A by matrix B.

Find:

A × A	|A|	A^T	A^{-1}	B × B	|B|
B^T	B^{-1}	A + B	A - B	A × B	B × A
(A^{-1} × B)	B^{-1} × A				

Result:

Result:

$$A^{-1} \times B = \begin{bmatrix} 0.5556 \\ 1.2222 \\ 2.8889 \end{bmatrix}$$

Enter decimal: 0. [____5555]	Enter decimal: 0. [____2222]	Enter decimal: 0. [____8888]
digits in front repeating part (can be empty)	digits in front repeating part (can be empty)	digits in front repeating part (can be empty)
Decimal: $0.\overline{5555}$ or $0.555555555555...$ Fraction: $\dfrac{5555}{9999} = \dfrac{5}{9}$	Decimal: $0.\overline{2222}$ or $0.222222222222...$ Fraction: $\dfrac{2222}{9999} = \dfrac{2}{9}$	Decimal: $0.\overline{8888}$ or $0.888888888888...$ Fraction: $\dfrac{8888}{9999} = \dfrac{8}{9}$
$x = \dfrac{5}{9}$	$y = \dfrac{9}{9} + \dfrac{2}{9} = \dfrac{11}{9}$	$z = \dfrac{18}{9} + \dfrac{8}{9} = \dfrac{26}{9}$

Try examples 2 and 3 from the notes. They are already in standard form, so they're ready for the online matrix calculator.

ANSWERS:

Example 2:

$$A^{-1} \times B = \begin{bmatrix} 2 \\ -1 \\ 1 \end{bmatrix}$$

Example 3:

$$A^{-1} \times B = \begin{bmatrix} 1 \\ -2 \\ -3 \end{bmatrix}$$