Bellwork

Use Cramer’s Rule to solve system of equations

\[
\begin{align*}
4x - 2y &= 10 \\
3x - 5y &= 11
\end{align*}
\]

8.5 answer key

p. 625
8) (-1, 2)  9) not possible  10) (7, 5)
13) (-1, 3, 2)  15) (1, 1, -1)  22) 33/2
26) 55  33) y = 0 , \ y = 16/5
37) area = 250 sq miles
p. 605
51) (2, -2)  54) (6, -2)
65) (7000, 1000, 2000)
Unit 8 Matrices Review

GOAL: Perform matrix operations, find determinates and inverses, solve systems of equations

Encoding a Message:

1.) Break up the message into groups (including spaces, but ignoring punctuation).
2.) Message matrix must match the order of the encoding matrix
3.) multiply each matrix by the given matrix A (hint: use your calculator)
4.) Gives you a new matrix which is your encoded message and you write it as a string of numbers without the matrix notation.
Example 4: Write a cryptogram for the message using Matrix A.

\[ A = \begin{bmatrix} 1 & 2 & 2 \\ 3 & 7 & 9 \\ -1 & -4 & -7 \end{bmatrix} \]

DO YOUR HOMEWORK

Decoding a Message:
1.) Find the inverse of Matrix A (hint: use your calculator)
2.) Then break up the encoded message into groups.
3.) Multiply the matrices by the inverse of Matrix A which gives you your decoded message.
4.) Write as a string of numbers and apply the chart from cryptography slide!
Example 5: Use $A^{-1}$ to decode the cryptogram.

$A = \begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix}$

use $1 \times 2$

$11, 21, 64, 112, 25, 50, 29, 53, 23, 46, 40, 75, 55, 92$

$A = \begin{bmatrix} 1 & -1 & 0 \\ 1 & 0 & -1 \\ -6 & 2 & 3 \end{bmatrix}$

$9, -1, -9, 38, -19, -19, 28, -9, -19, -80, 25, 41, -64, 21, 31, 9, -5, -4$

practice

p. 627 #63, 65
Encoding a Matrix

On a piece of notebook paper:
Message from: ___________Decoded by: _____________________

Write a message that is at least 15 characters (including spaces and make it school appropriate)

Break this into a matrix with two rows.

Come up with your own 2 x 2 invertible matrix to encode your message.

Multiply your invertible matrix by your message matrix to get your encoded message.

Decode a matrix

Turn your encoded matrix into Mrs. Wilson

You will receive an encoded matrix from a classmate.

Put your coded message into a matrix with two rows. Find the inverse of matrix A used to encode the message.

Multiply inverse matrix by your coded message to get decoded matrix.

Find corresponding letters to determine your message.
HW Quiz

8.1 p. 579 # 27
8.1 day 2 p. 579 # 63
8.2 p. 594 #19, 51
8.4 p. 613 # 14
8.4 p. 613 # 43
8.3 p. 605 # 19
8.5 p. 625 # 8

Unit 8 Study Guide

1. Add, subtract, and scalar multiply matrices (and more than two matrices)
2. Find determinant of 2x2
3. Find inverse of a 2x2
4. Solve system of two equations using matrices.
5. Use Cramer’s rule to solve system of two equations.
6. Find determinant of a 3x3 matrix
7. Multiply matrices by hand with work
8. Elementary row operations to get matrix in reduced row echelon form (2x2 matrix and 3x3)
9. Solve story problem with investments using matrices
10. Decode a message using matrices.