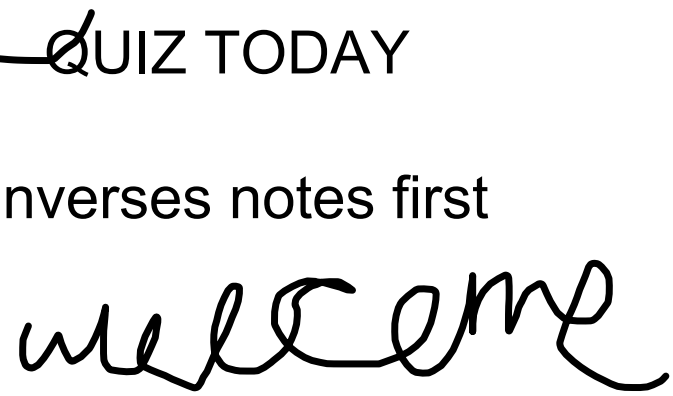
QUIZ TODAY

Inverses notes first



Feb 7-11:58 AM

Inverses

Start with: $\frac{1}{|A|}$ or $\frac{1}{\det(A)}$

Create the **Adjugate Matrix**:

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \Rightarrow \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

Multiply: $\frac{1}{|A|} \cdot \begin{bmatrix} d & -b \\ -c & a \end{bmatrix} = A^{-1}$

Secondary I Honors Matrices Unit Name: _____

Identity and Inverse Matrices Hour_____

1. Find $\frac{1}{|A|}$ if $A = \begin{bmatrix} 6 & -7 \\ -2 & 4 \end{bmatrix}$

2. What is $\frac{1}{|A|}$ used for? _____

3. Why do we use inverses of matrices?

4. Write a 4X4 identity matrix.

For each matrix state if an inverse exists

5. $\begin{bmatrix} -9 & -9 \\ 2 & 2 \end{bmatrix}$

6. $\begin{bmatrix} -2 & 1 \\ -6 & 1 \end{bmatrix}$

7. $\begin{bmatrix} 4 & -5 \\ -9 & 6 \end{bmatrix}$

8. $\begin{bmatrix} 0 & 0 \\ -6 & 4 \end{bmatrix}$

Find the inverse of each matrix

9. $\begin{bmatrix} 1 & -5 \\ 2 & -11 \end{bmatrix}$

$-11 + 10$

-1

$\frac{1}{-1} \cdot \begin{bmatrix} -11 & 5 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 11 & -5 \\ 2 & -1 \end{bmatrix}$

10. $\begin{bmatrix} 0 & -2 \\ -1 & -9 \end{bmatrix}$

$0 - 2$ *

$\frac{1}{-2} \begin{bmatrix} -9 & 2 \\ 1 & 0 \end{bmatrix} = \begin{bmatrix} \frac{9}{2} & -1 \\ -\frac{1}{2} & 0 \end{bmatrix}$

11. $\begin{bmatrix} -1 & 7 \\ -1 & 7 \end{bmatrix}$

12. $\begin{bmatrix} 1 & -1 \\ -6 & -3 \end{bmatrix}$

13. $\begin{bmatrix} 3 & -2 \\ -4 & 6 \end{bmatrix}$

14. $\begin{bmatrix} -6 & 11 \\ -4 & 7 \end{bmatrix}$

$18 - 8 = 10$

$\frac{1}{10}\begin{bmatrix} 6 & 2 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} \frac{6}{10} & \frac{2}{10} \\ \frac{4}{10} & \frac{3}{10} \end{bmatrix}$

15. $\begin{bmatrix} -9 & -6 \\ -5 & -4 \end{bmatrix}$

16. $\begin{bmatrix} 5 & -8 \\ 6 & -9 \end{bmatrix}$

17. $\begin{bmatrix} 2 & -1 & -3 \\ 4 & 1 & 0 \\ 3 & -4 & -2 \end{bmatrix}$

18. $\begin{bmatrix} 1 & 3 & 1 \\ 2 & 0 & 1 \\ 3 & 2 & 2 \end{bmatrix}$

Solve for x.

$A = \begin{bmatrix} -5 & 5 \\ 1 & -2 \end{bmatrix}$ $B = \begin{bmatrix} 9 & 3 \\ 0 & 3 \end{bmatrix}$ $C = \begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$

19. $AX = B$

20. $CX = A$

$A^{-1} \cdot A X = A^{-1} \cdot B$

But for a 3x3.....

$$adj\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix} = \begin{pmatrix} +\begin{vmatrix} e & f \\ h & i \end{vmatrix} & -\begin{vmatrix} b & c \\ h & i \end{vmatrix} & +\begin{vmatrix} b & c \\ e & f \end{vmatrix} \\ -\begin{vmatrix} d & f \\ g & i \end{vmatrix} & +\begin{vmatrix} a & c \\ g & i \end{vmatrix} & -\begin{vmatrix} a & c \\ d & f \end{vmatrix} \\ +\begin{vmatrix} d & e \\ g & h \end{vmatrix} & -\begin{vmatrix} a & b \\ g & h \end{vmatrix} & +\begin{vmatrix} a & b \\ d & e \end{vmatrix} \end{pmatrix}$$

Then: $\frac{1}{|A|} \cdot adj(A)$

17. $\begin{bmatrix} 2 & -1 & -3 \\ 4 & 1 & 0 \\ 3 & -4 & -2 \end{bmatrix}$

$\begin{bmatrix} -2 & -8 & -19 \\ -10 & 5 & -5 \\ 3 & 12 & 6 \end{bmatrix}$

$da = 4 + -8 + 57$

45

$\frac{1}{45} \cdot \begin{bmatrix} -2 & 8 & -19 \\ 10 & 5 & 5 \\ 3 & -12 & 6 \end{bmatrix}$

Finish Standards 6C Opportunity 1

Carefully fill out bubble sheets and double check answers!

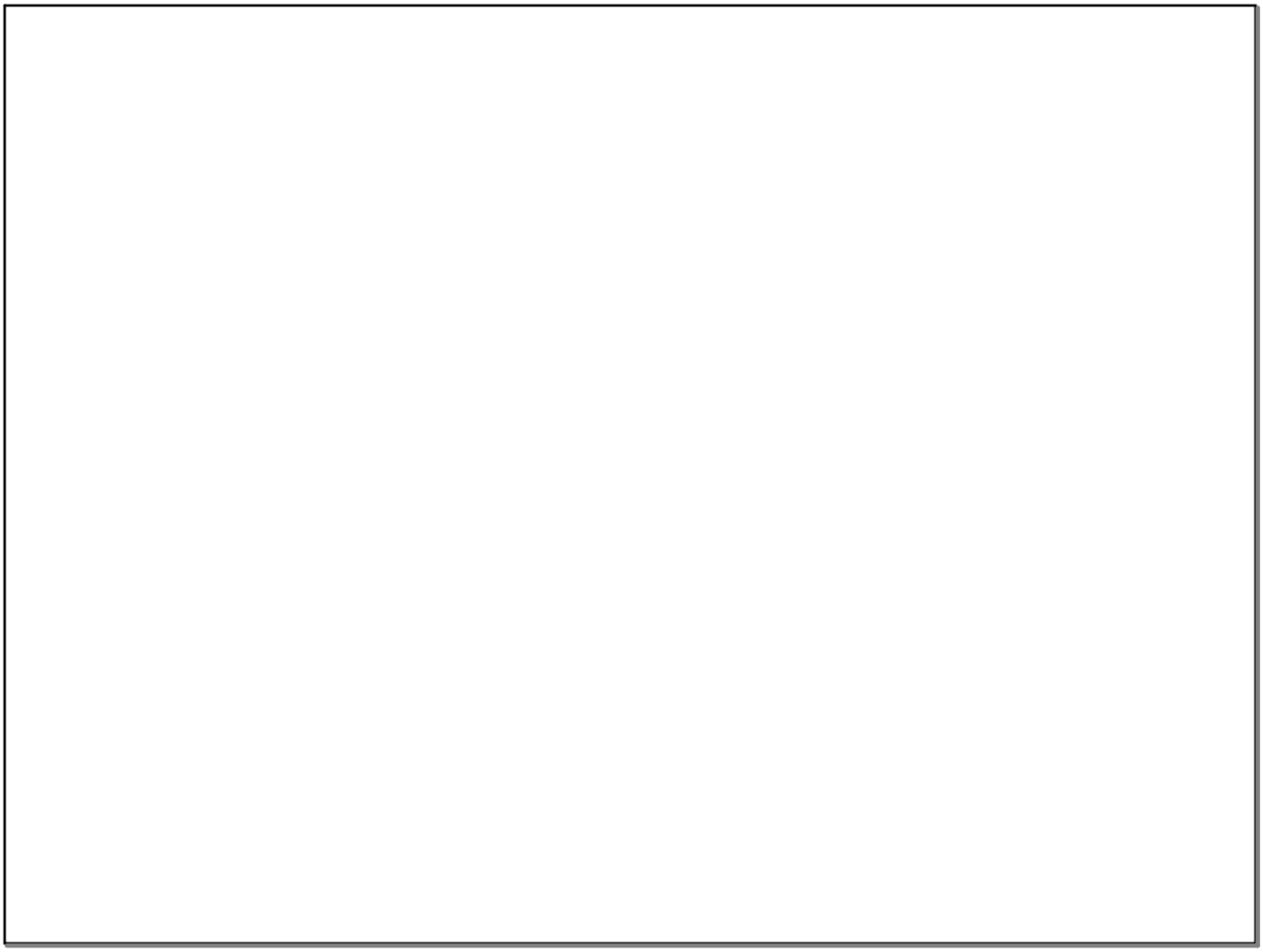
No Phones

When finished:

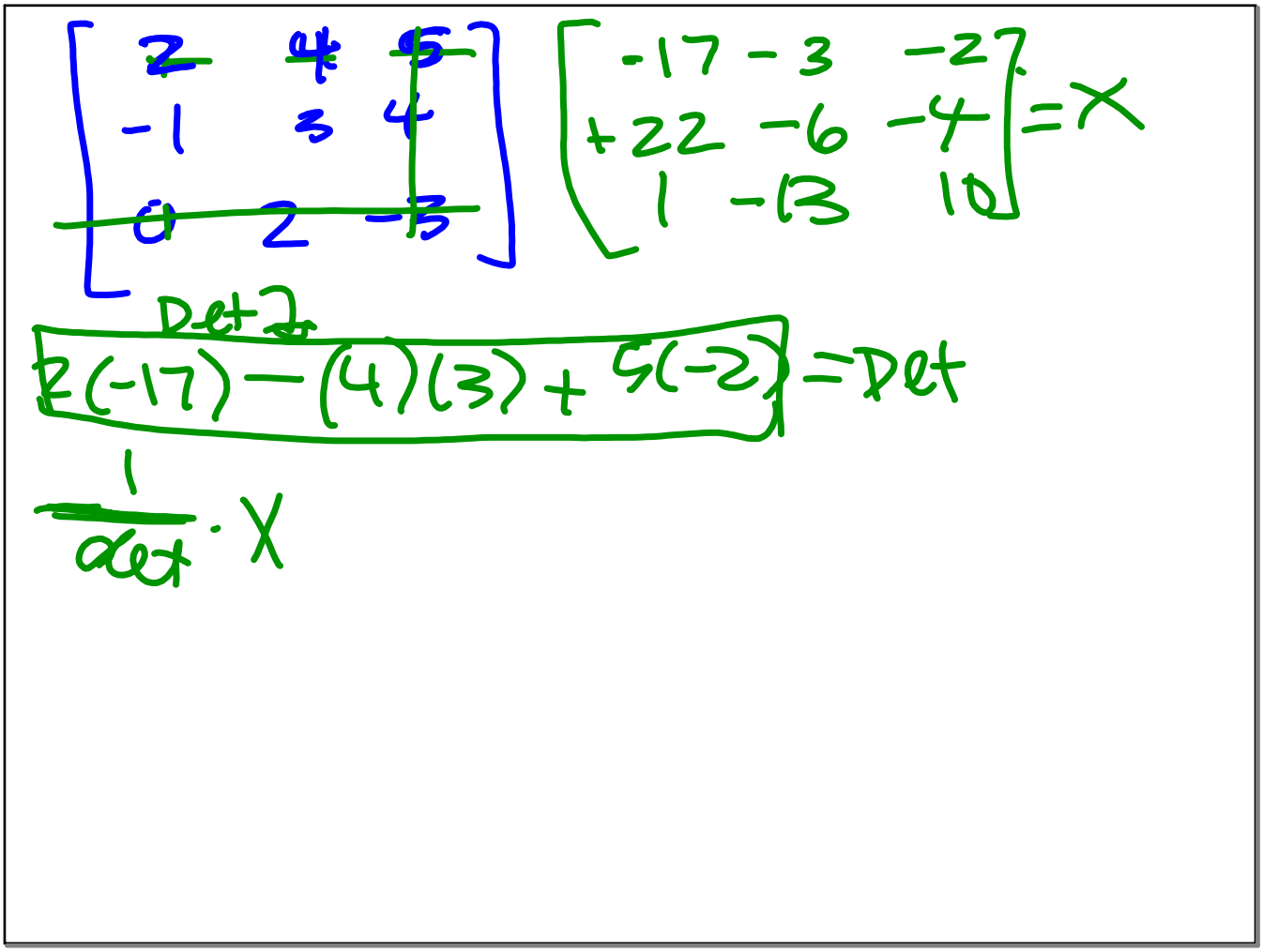
Staple and hand in the basket
Finish missing hw
Read

15 minutes

Jan 8-10:08 PM



Feb 10-2:10 PM


2 4 5
-1 3 4
0 2 -3
-17 -3 -2
+22 -6 -4
1 -13 10
=X
Det 2
2(-17) − (4)(3) + 5(-2) = Det
1/det · X

Solving Systems using Matrices

$3x+y=5$
$2x-y=0$

We can rewrite our system using a matrix

$$\begin{bmatrix} 3 & 1 \\ 2 & -1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \end{bmatrix}$$

Coefficients Variables Constants

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

$X = \begin{bmatrix} x \\ y \end{bmatrix}$

$B = \begin{bmatrix} 5 \\ 0 \end{bmatrix}$

Then use the equation AX=B to solve our system

$$A^{-1} \cdot X = A^{-1} \cdot B$$

Solve the system using matrices