1) (4, -3, 2)

2) (1, 2, 3)

3) (.5, 1, -1)

4) (7, 9, 3)

5) (6, 6, -4)

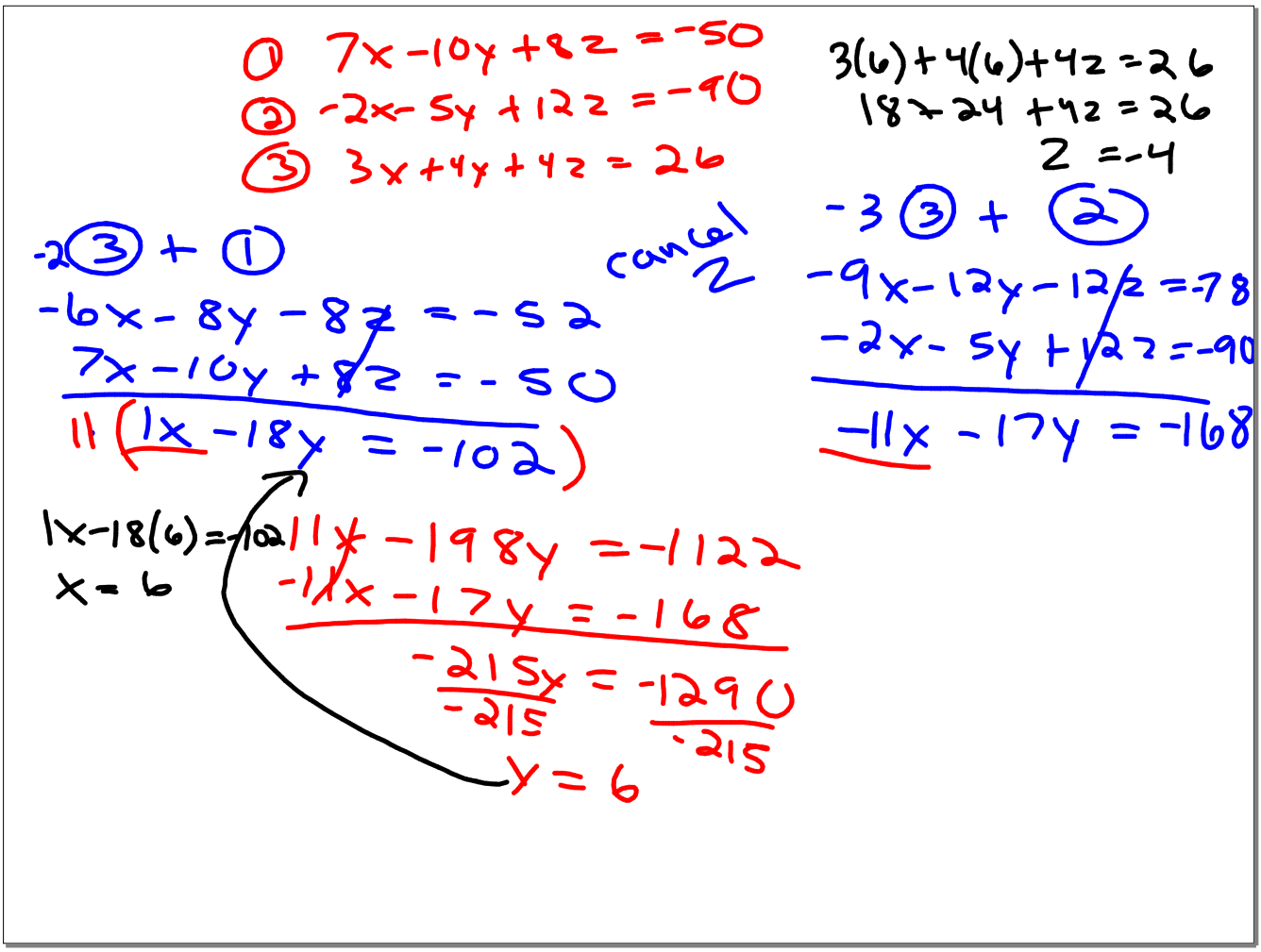
6) (10, -10, 6)

Solving 3 X 3 Systems

-Yellow WS

Check Answers!

Nov 9-10:15 AM


① 7x-10y+8z=-50
② -2x-5y+12z=-90
③ 3x+4y+4z=26
-2③ + ①
cancel 2
-6x-8y-8z=-52
7x-10y+8z=-50
11(1x-18y=-102)
1x-18(6)=-102
x=6
11x-198y=-1122
-11x-17y=-168
-215y=-1290
-215 -215
y=6
3(6)+4(6)+4z=26
18+24+4z=26
2=-4
-3③ + ②
-9x-12y-12z=-78
-2x-5y+12z=-90
-11x-17y=-168

~~*QUIZ (20 min)~~

*Happy Thanksgiving!

*3 variable DLT

Nov 2-2:19 PM

Unit 4 (3.5/3.6) Adding, Subtracting, and Multiplying Matrices

* Need a graphing calculator today!

Oct 2-12:19 PM

A matrix is a rectangular arrangement of numbers in rows and columns.

rows $A = \begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$

Dimensions - 2x3 (# of rows x # of columns)

Matrices are equal if they have the same dimension and all the same entries.

2x2

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

2x2

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

Dec 21-8:35 AM

Add/Subtract- only if the dimensions are the same

KEY CONCEPT *For Your Notebook*

Adding and Subtracting Matrices

To add or subtract two matrices, simply add or subtract elements in corresponding positions. You can add or subtract matrices only if they have the same dimensions.

Adding Matrices

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} + \begin{bmatrix} e & f \\ g & h \end{bmatrix} = \begin{bmatrix} a+e & b+f \\ c+g & d+h \end{bmatrix}$$

Subtracting Matrices

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} - \begin{bmatrix} e & f \\ g & h \end{bmatrix} = \begin{bmatrix} a-e & b-f \\ c-g & d-h \end{bmatrix}$$

Dec 21-8:36 AM

a. $\begin{bmatrix} 3 & -1 & 9 \\ -4 & 2 & 0 \end{bmatrix} - \begin{bmatrix} -5 & 6 & 1 \\ .5 & 2 & 7 \end{bmatrix} = \begin{bmatrix} 8 & -7 & 8 \\ -4.5 & 0 & -7 \end{bmatrix}$

2 × 3 2 × 3

b. $\begin{bmatrix} 4 & 0 & -2.1 \\ 3 & -1 & 5 \\ 6 & 7.9 & 10 \end{bmatrix} + \begin{bmatrix} 6 & 1 & 1.1 \\ 4 & -6 & 4 \\ 4 & -3.9 & 7 \end{bmatrix} = \begin{bmatrix} 10 & 1 & -1 \\ 7 & -7 & 9 \\ 10 & 4 & 17 \end{bmatrix}$

c. $-3\begin{bmatrix} -1 & 0 & 9 \\ 2 & -6 & 1 \end{bmatrix} = \begin{bmatrix} 3 & 0 & -27 \\ -6 & 18 & -3 \end{bmatrix}$

Dec 21-8:38 AM

B = 4 x 3

D = 4 x 3

#1-10

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

(12) $X + B = D$

$$X + \begin{bmatrix} 1 & -3 & 2 \\ 9 & 5 & 3 \\ -7 & 18 & 0 \\ -4 & -9 & 0 \end{bmatrix} = \begin{bmatrix} 1 & 4 & -1 \\ 2 & -1 & 0 \\ 0 & 0 & 3 \\ 16 & 4 & -12 \end{bmatrix}$$

$$X = \begin{bmatrix} 1 & 4 & -1 \\ 2 & -1 & 0 \\ 0 & 0 & 3 \\ 16 & 4 & -12 \end{bmatrix} - \begin{bmatrix} 1 & -3 & 2 \\ 9 & 5 & 3 \\ -7 & 18 & 0 \\ -4 & -9 & 0 \end{bmatrix}$$

$$X = \begin{bmatrix} 0 & 7 & -3 \\ -7 & -6 & 3 \\ 7 & -18 & 3 \\ 20 & 13 & -12 \end{bmatrix}$$

(13) $2X - C = A$

$$\frac{2X}{2} = \frac{A + C}{2}$$

$$X = \frac{A+C}{2}$$

CONCEPT SUMMARY *For Your Notebook*

Properties of Matrix Operations

Let A, B, and C be matrices with the same dimensions, and let k be a scalar.

Associative Property of Addition	$(A + B) + C = A + (B + C)$
Commutative Property of Addition	$A + B = B + A$
Distributive Property of Addition	$k(A + B) = kA + kB$
Distributive Property of Subtraction	$k(A \quad B) = kA \quad kB$

Nov 10-10:14 AM

$Let\ A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}, B=\begin{bmatrix}-2 & 4\\ 8 & -6\end{bmatrix}, and\ C=\begin{bmatrix}1\\ 2\end{bmatrix}$

a. $A+2B=$

b. $A-B+C=$

Dec 21-8:38 AM

#11-15

11) $3A-X=C$

Nov 20-1:49 PM

Multiplying Matrices

$$A \cdot B = AB$$

$$m \times n \quad n \times p \qquad m \times p$$

2 × 3 3 × 2

2 × 2

equal

dimensions of AB

Oct 2-12:35 PM

KEY CONCEPT *For Your Notebook*

Multiplying Matrices

Words To find the element in the ith row and jth column of the product matrix AB, multiply each element in the ith row of A by the corresponding element in the jth column of B, then add the products.

Algebra

$$\underset{A}{\begin{bmatrix} a & b \\ c & d \end{bmatrix}} \cdot \underset{B}{\begin{bmatrix} e & f \\ g & h \end{bmatrix}} = \underset{AB}{\begin{bmatrix} ae + bg & af + bh \\ ce + dg & cf + dh \end{bmatrix}}$$

Nov 10-10:15 AM

$$\begin{bmatrix} 2 & 3 \\ -4 & 1 \end{bmatrix} \cdot \begin{bmatrix} 0 & -9 \\ 4 & -5 \end{bmatrix} =$$

$2\times 2 \quad 2\times 2$

$$\begin{bmatrix} 2(0)+3(4) & 2(-9)+3(-5) \\ -4(0)+1(4) & -4(-9)+1(-5) \end{bmatrix}$$

$$\begin{bmatrix} 12 & -33 \\ 4 & 31 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 4 & -1 \\ 8 & -3 & -2 \end{bmatrix} \cdot \begin{bmatrix} 4 & 0 \\ 1 & 0 \end{bmatrix} =$$

$2 \times 3 \quad X \quad 2 \times 2$

Not possible

Navigator

★ **MULTIPLE CHOICE** What is the product of $\begin{bmatrix} 1 & -4 \\ 3 & -2 \end{bmatrix}$ (A) and $\begin{bmatrix} 4 & -1 \\ 0 & -3 \end{bmatrix}$ (B)?

(A) $\begin{bmatrix} -4 & 12 \\ 3 & -3 \end{bmatrix}$ (B) $\begin{bmatrix} 4 & 11 \\ 12 & 3 \end{bmatrix}$ (C) $\begin{bmatrix} -4 & 11 \\ 12 & -3 \end{bmatrix}$ (D) $\begin{bmatrix} 4 & -11 \\ 0 & 3 \end{bmatrix}$

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

4 11

Jan 5-4:10 PM

$$\begin{bmatrix} 3 & -5 & 1 \\ 0 & -1 & -9 \\ -7 & 1 & 4 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} = \begin{bmatrix} 3(1)+-5(2)+1(3) \\ 0(1)+-1(2)+-9(3) \\ -7(1)+1(2)+4(3) \\ -7+2+12 \end{bmatrix}$$

$$\begin{bmatrix} -4 \\ -29 \\ 7 \end{bmatrix}$$

3 X 3 ✓ 3 X 1

Dec 21-8:38 AM

CONCEPT SUMMARY *For Your Notebook*

Properties of Matrix Multiplication

Let A, B, and C be matrices and let k be a scalar.

Associative Property of Matrix Multiplication	$A(BC) = (AB)C$
Left Distributive Property	$A(B + C) = AB + AC$
Right Distributive Property	$(A + B)C = AC + BC$
Associative Property of Scalar Multiplication	$k(AB) = (kA)B = A(kB)$

Nov 10-10:16 AM

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\left(\begin{bmatrix} 3 \\ 4 \end{bmatrix}_{2\times1}+\begin{bmatrix} -1 \\ -2 \end{bmatrix}_{2\times1}\right)=$$

(same Dim)

#16-25

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 2 \\ 2 \end{bmatrix}=\begin{bmatrix} 1(2)+2(2) \\ 3(2)+4(2) \end{bmatrix}=\begin{bmatrix} 6 \\ 14 \end{bmatrix}$$

2×2 2×1

$$\begin{bmatrix} 9 & 8 & 7 \\ 6 & 5 & 4 \end{bmatrix} \begin{bmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{bmatrix} =$$

$$\begin{bmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{bmatrix} \begin{bmatrix} 9 & 8 & 7 \\ 6 & 5 & 4 \end{bmatrix} =$$

Dec 21-8:44 AM

Solve for x and y.

$$2\begin{bmatrix} 8 & -x \\ 5 & 6 \end{bmatrix} - \begin{bmatrix} 3 & -9 \\ 10 & -4y \end{bmatrix} = \begin{bmatrix} 13 & 3 \\ 0 & 16 \end{bmatrix}$$

$$\begin{bmatrix} 16 & -2x \\ 10 & 12 \end{bmatrix} = \begin{bmatrix} 3 & -9 \\ 10 & -4y \end{bmatrix} = \begin{bmatrix} 13 & 3 \\ 0 & 16 \end{bmatrix}$$

$16 - 3 = 13$

$-2x - -9 = 3$

$-2x + 9 = 3$

$-9 \quad -9$

$\frac{-2x}{-2} = \frac{-6}{-2}$

$x = 3$

$12 - -4y = 16$

$12 + 4y = 16$

$-12 \quad -12$

$\frac{4y}{4} = \frac{4}{4}$

$y = 1$

Nov 9-10:35 AM

And your homework:
Unit Plan Day 3 (3.5/3.6)

*Matrix worksheet

Oct 9-8:28 PM