Solve this equation for matrix X.

$$\begin{bmatrix} 47 & 51 \\ -78 & 104 \end{bmatrix} - X = \begin{bmatrix} 18 & -33 \\ 9 & 85 \end{bmatrix}$$

Add X to both sides and subtract the matrix on the right to get it to the left.

You would end up with this equation:

$$\begin{bmatrix} 47 & 51 \\ -78 & 104 \end{bmatrix} - \begin{bmatrix} 18 & -33 \\ 9 & 85 \end{bmatrix} = X$$

Now use matrix subtraction to get:

$$X = \begin{bmatrix} 29 & 84 \\ -87 & 19 \end{bmatrix}$$

Find the value of each variable.

$$\begin{bmatrix} 40 & 33 & x+5 \\ 4y-7 & 100 & -75 \end{bmatrix} = \begin{bmatrix} 3z+4 & 33 & 84 \\ 30 & 8-4w & -75 \end{bmatrix}$$

Since the two matrices are equal this means corresponding elements must be equal

$40 = 3z + 4$
$z = 12$

$x + 5 = 84 \quad x = 79$

$4y - 7 = 30$
$y = 37/4$

$8 - 4w = 100$
$w = -23$

Given $\quad A \begin{bmatrix} 12 & -27 \\ 9 & 15 \\ -34 & -50 \end{bmatrix}$

What is matrix Y if $\quad A - Y = \begin{bmatrix} 48 & -23 \\ 57 & -2 \\ 0 & 18 \end{bmatrix}$

By adding Y to both sides and subtracting the matrix on the right side of the equation you get the following equation:

$$A - \begin{bmatrix} 48 & -23 \\ 57 & -2 \\ 0 & 18 \end{bmatrix} = Y \longrightarrow \begin{bmatrix} 12 & -27 \\ 9 & 15 \\ -34 & -50 \end{bmatrix} - \begin{bmatrix} 48 & -23 \\ 57 & -2 \\ 0 & 18 \end{bmatrix} = Y$$

$$Y \begin{bmatrix} -36 & -4 \\ -48 & 17 \\ -34 & -68 \end{bmatrix}$$

Find the value of each variable.

$$\begin{bmatrix} 7 & 4 \\ -10 & y \end{bmatrix} + \begin{bmatrix} x & -13 \\ -6 & 4 \end{bmatrix} = \begin{bmatrix} 23 & z \\ w & 44 \end{bmatrix}$$

$$\begin{pmatrix} 7+x & -9 \\ -16 & y+4 \end{pmatrix} = \begin{pmatrix} 23 & z \\ w & 44 \end{pmatrix}$$

$w = -16$

set corresponding elements equal

$7 + x = 23$
$y + 4 = 44$
$z = -9$

we get

$w = -16$
$x = 16$
$y = 40$
$z = -9$

You can now finish Hwk #22   Sec 4-2

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Due Tomorrow

Problems   3, 5, 7, 10, 11, 16, 19, 20, 32

Matrices using the graphing calculator.

To enter a matrix on a calculator:

1. 2ND X^{-1} (MATRIX) → EDIT

2. Move up/down to pick the matrix you want to use
   then   ENTER

3. Enter the dimensions for your matrix

4. Enter the data in the matrix

5. When done Editing you must press   2ND   mode (quit)
   This exits the editing mode and takes you back to the home screen

---

Enter the following matrices on the calculator.

$A \begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix}$ $B \begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix}$ $C \begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$

Perform this matrix operation on the calculator: A + B

1. 2ND X^{-1} (MATRIX) → NAME   1: [A]

2. +

3. 2ND X^{-1} (MATRIX) → NAME   2: [B]

After these steps you'll see the following on the screen.

[A]+[B]

press ENTER to get the result.

$\begin{bmatrix} 15 & 9 & 12 \\ 17 & -14 & 13 \end{bmatrix}$

$A \begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix}$ $B \begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix}$ $C \begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$

Find each

1. B - C

$\begin{bmatrix} 16 & 12 & 10 \\ -3 & 8 & -48 \end{bmatrix}$

2. C - A - B

$\begin{bmatrix} -21 & -18 & -13 \\ 3 & 1 & 36 \end{bmatrix}$

3. B + C - A

$\begin{bmatrix} -1 & -12 & 5 \\ 37 & -9 & 38 \end{bmatrix}$

$$A \begin{bmatrix} 5 & 6 & 3 \\ 0 & -9 & 12 \end{bmatrix} \quad B \begin{bmatrix} 10 & 3 & 9 \\ 17 & -5 & 1 \end{bmatrix} \quad C \begin{bmatrix} -6 & -9 & -1 \\ 20 & -13 & 49 \end{bmatrix}$$

Find this matrix: 2A

$$2[A] = \begin{bmatrix} 10 & 12 & 6 \\ 0 & -18 & 24 \end{bmatrix}$$

this multiplies all elements in matrix A by 2.