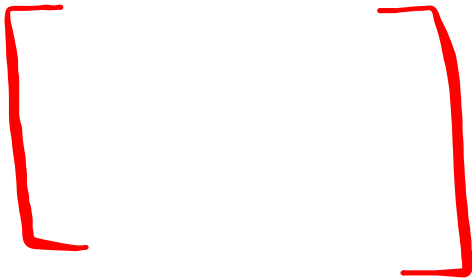


Google it



what is a matrix?

what are matrices?

rectangular  
arrangement of  
numbers into  
rows and columns

A red double-headed arrow is drawn below the word "rows", and a blue double-headed arrow is drawn below the word "columns".

## Adding/Subtracting Matrices

Must have same size / dimension

Read: Row x Column

$$4 \times 2$$

$$4 \begin{bmatrix} 0 & 2 \\ 0 & 2 \\ 0 & 2 \\ 0 & 2 \end{bmatrix}$$

$$\begin{array}{c} 2 \times 2 \\ R_1 \\ R_2 \end{array} \begin{bmatrix} c_1 & c_2 \\ a & b \\ c & d \end{bmatrix} + \begin{array}{c} 2 \times 2 \\ R_1 \\ R_2 \end{array} \begin{bmatrix} c_1 & c_2 \\ e & f \\ g & h \end{bmatrix} = \begin{bmatrix} a+c & b+f \\ c+g & d+h \end{bmatrix}$$

$$\begin{bmatrix} 1 & -5 \\ 4 & 2 \end{bmatrix} + \begin{bmatrix} 3 & 2 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 1+3 & -5+2 \\ 4-2 & 2+1 \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 2 & 3 \end{bmatrix}$$

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

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

$3 \times 3$                        $3 \times 3$

## Multiply by a scalar

$$2 \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} = \begin{bmatrix} 2 \cdot 1 & 2 \cdot 2 \\ 2 \cdot 3 & 2 \cdot 4 \end{bmatrix} = \begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}$$

$$2 \cdot \begin{bmatrix} 10 & 6 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} 2 \cdot 10 & 2 \cdot 6 \\ 2 \cdot 4 & 2 \cdot 3 \end{bmatrix} = \begin{bmatrix} 20 & 12 \\ 8 & 6 \end{bmatrix}$$

$$\begin{matrix} 2 \times 2 \\ \left[ \begin{array}{cc} - & - \\ - & - \end{array} \right] \end{matrix} + \begin{matrix} 3 \times 1 \\ \left[ \begin{array}{c} - \\ - \\ - \end{array} \right] \end{matrix} = \text{X}$$

$$A = \begin{matrix} 2 \times 1 \\ \begin{bmatrix} 17 \\ 53 \end{bmatrix} \end{matrix} \quad B = \begin{bmatrix} 4 \\ 8 \end{bmatrix}$$

Scalar  $\rightarrow$

$$3A - 2B$$
$$3 \begin{bmatrix} 17 \\ 53 \end{bmatrix} - 2 \begin{bmatrix} 4 \\ 8 \end{bmatrix} = \begin{bmatrix} 43 \\ 143 \end{bmatrix}$$
$$\begin{bmatrix} 51 \\ 159 \end{bmatrix} - \begin{bmatrix} 8 \\ 16 \end{bmatrix}$$



15)

$$\frac{-2A}{-2} = \begin{bmatrix} \frac{6}{-2} & \frac{20}{-2} \end{bmatrix} \quad \frac{-2x}{-2} = \frac{50}{-2}$$
$$A = \begin{bmatrix} -3 & -10 \end{bmatrix}$$

17)

$$\begin{bmatrix} 14 & -3 & 0 & -16 \end{bmatrix} = Z + \begin{bmatrix} 3 & -6 & 2 & -7 \end{bmatrix} - \begin{bmatrix} 3 & -6 & 2 & -7 \end{bmatrix}$$