

4.2 Matrix Addition

In order to add or subtract matrices, each must have the dimensions.

Recall: $R \times C$

$I =$ boots
sandals
running shoes

	8	9	10	11
boots	3	7	9	4
sandals	5	2	5	11
running shoes	7	10	12	13

$D =$ boots
sandals
running shoes

	8	9	10	11
boots	7	3	10	6
sandals	5	0	4	3
running shoes	9	2	1	0

$I + D =$ boots
sandals
running shoes

	8	9	10	11
boots	10	10	20	10
sandals	10	2	9	14
running shoes	16	12	13	13

Commutative:

$$I + D \stackrel{?}{=} D + I \quad \checkmark \text{ true}$$

associative:

$$(C + I) + D \stackrel{?}{=} C + (I + D)$$

$\checkmark \text{ true}$

$$A = \begin{bmatrix} \underline{3} & \underline{-1} \\ \underline{4} & \underline{8} \end{bmatrix}$$

2x2

$$B = \begin{bmatrix} \underline{-2} & \underline{5} \\ \underline{1} & \underline{4} \end{bmatrix}$$

2x2

$$A - B = \begin{bmatrix} \underline{5} & \underline{-6} \\ \underline{3} & \underline{4} \end{bmatrix}$$

-1-5

$$B - A = \begin{bmatrix} \underline{-5} & \underline{6} \\ \underline{-3} & \underline{-4} \end{bmatrix}$$

not
equal

Scalar Multiplication

$$3(x+5) = 3 \cdot x + 3 \cdot 5$$

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

$$\begin{bmatrix} 6 & -3 \\ 12 & 12 \\ 15 & 6 \end{bmatrix}$$

$$\begin{bmatrix} 6 & -3 \\ 12 & 12 \\ 15 & 6 \end{bmatrix}$$

$$4 \begin{bmatrix} -2 & -1 \\ 5 & 1 \\ 8 & 8 \end{bmatrix}$$

$$\begin{bmatrix} -8 & -4 \\ 20 & 4 \\ 32 & 32 \end{bmatrix}$$

4A - B

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