Matrix Multiplication Quiz

let A be a matrix of 1 x 5 and B be matrix of 5 x 3.

$$A = \begin{bmatrix} 0.6 & -15 & 2 & 5 & 98 \end{bmatrix}$$

$$B = \begin{bmatrix} 2 & 2 & -4 \\ 9 & -14 & 0 \\ 13 & -0.5 & 44 \\ 1 & 9 & 4 \\ 0 & 0 & 5 \end{bmatrix}$$

Notice that A is actually a row vector! **A matrix with only one row or one column is a vector**

- A matrix with only one row is a row vector
- A matrix with only one column is a column vector

If $C = A \times B$,

(a) How many rows will C have?

(b) How many columns will C have?

(c) What will be the value of c_{13}?

If $C = B \times A$,

(d) What will be the value of c_{13}?

Answer:

a. 1
b. 3
c. 595.6
d. None

Notice that in this quiz, we multiplied a vector by a matrix, which resulted in another vector. Essentially what happened was that our original vector, , went through a linear transformation and transformed into another vector with the use of the transformation matrix

$$\begin{bmatrix} 2 & 2 & -4 \\ 9 & -14 & 0 \\ 13 & -0.5 & 44 \\ 1 & 9 & 4 \\ 0 & 0 & 5 \end{bmatrix}$$