Multiplying Matrices

$$\underset{a\times b}{[\ ]}\cdot\underset{b\times c}{[\ ]}=\underset{a\times c}{[\ ]}$$

(row x column)

Have to be the same in order to Multiply

Ex: $\underset{2\times 2}{\begin{bmatrix}3 & -5\\ 2 & 7\end{bmatrix}}\cdot\underset{2\times 3}{\begin{bmatrix}5 & 1 & -3\\ 8 & -4 & 9\end{bmatrix}}$

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

$$=\begin{bmatrix}-25 & 23 & -54\\ 66 & -26 & 57\end{bmatrix}$$

Pg 202 Prob 19-21