Maths theory

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1 Dot Product

Dot Product

$$\begin{bmatrix} a & b \end{bmatrix} \bullet \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} ax+by \end{bmatrix}$$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \bullet \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} ax+by \\ cx+dy \end{bmatrix}$$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \bullet \begin{bmatrix} w & x \\ y & z \end{bmatrix} = \begin{bmatrix} aw+by & ax+bz \\ cw+dy & cx+dz \end{bmatrix}$$

Note that the order the matrices are multiplied in is important

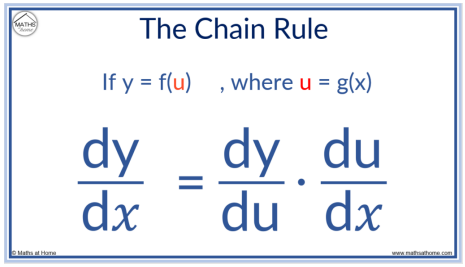
- The "Dot Product" multiplies the row of one matrice with the column of the other, by multiplying matching members and then summing up.
- The number of columns of the 1st matrix must equal the number of rows of the 2nd matrix. And the result will have the same number of rows as the 1st matrix, and the same number of columns as the 2nd matrix.

2 Chain Rule of Differentiation

Note that $\frac{\partial y}{\partial x}$, means derivative of y with respect to x

3 Partial Derivatives

- The "Partial Derivative" is the derivative of a function with more than one variable, by having respect to only one variable and treating the other/s as a constant


The Chain Rule
If y = f(u) , where u = g(x)
dy/dx = dy/du · du/dx
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