$$\boxed{\frac{\partial(Bx)}{\partial x} = B}$$, where $B \in \mathbb{R}^{m \times n}$ and B doesn't depend on $x \in \mathbb{R}^n$.

let $B = \begin{bmatrix} b_{11} & \cdots & b_{1n} \\ \cdots & & \\ b_{m1} & \cdots & b_{mn} \end{bmatrix}$

$$Bx = \begin{bmatrix} b_{11}x_1 + \ldots + b_{1n} \cdot x_n \\ \cdots \\ b_{m1}x_1 + \ldots + b_{mn} \cdot x_n \end{bmatrix} = \begin{bmatrix} r_1 \\ \vdots \\ r_m \end{bmatrix},$$

where $r_i = \sum_{j=1}^{n} b_{ij} \cdot x_j \in \mathbb{R}$

Then for any r_i,

$$\frac{\partial r_i}{\partial x} = \begin{bmatrix} b_{i1} & b_{i2} & \cdots & b_{in} \end{bmatrix}$$

As such,

$$\frac{\partial(Bx)}{\partial x} = \begin{bmatrix} b_{11} & b_{12} & \cdots & b_{1n} \\ \cdots & & & \\ b_{m1} & b_{m2} & \cdots & b_{mn} \end{bmatrix} = B$$