

$$\begin{bmatrix} \frac{\partial y_1}{\partial x_1} & \cdots & \frac{\partial y_1}{\partial x_n} \\ \vdots & \ddots & \vdots \\ \frac{\partial y_m}{\partial x_1} & \cdots & \frac{\partial y_m}{\partial x_n} \end{bmatrix} \cdot \begin{bmatrix} r_1 \\ \vdots \\ r_n \end{bmatrix} = \begin{bmatrix} \sum_{i=1}^n \frac{\partial y_1}{\partial x_i} \cdot r_i \\ \vdots \\ \sum_{i=1}^n \frac{\partial y_m}{\partial x_i} \cdot r_i \end{bmatrix}$$