

Summary of the Derivative Rules Used

- **For a scalar term** (independent of β): The derivative is zero.
- **For a linear term** $\mathbf{a}^T \mathbf{b}$: The derivative with respect to \mathbf{b} is \mathbf{a} .
- **For a quadratic form** $\beta^T \mathbf{A} \beta$ where \mathbf{A} is symmetric: The derivative is $2\mathbf{A}\beta$.

This is how we differentiate the RSS expression to find the coefficients β in the context of linear regression.