

• Dual Basis Interpretation of A^{-1}

$$A = \begin{bmatrix} | & & | \\ a_1 & \dots & a_n \\ | & & | \end{bmatrix} \quad A^{-1} = B = \begin{bmatrix} \hline b_1^T \\ \vdots \\ b_n^T \\ \hline \end{bmatrix}$$

$$\left. \begin{array}{l} y = Ax \\ x = A^{-1}y \end{array} \right\} y = Ax = \sum_i x_i \cdot a_i = \sum_i b_i^T y \cdot a_i$$

$a_1, \dots, a_n$ and $b_1, \dots, b_n$ are called dual basis

• RMS value and Euclidean distance

root-mean-square (RMS) value of $x \in \mathbb{R}^n$

$$\text{rms}(x) = \left(\frac{1}{n} \sum_i x_i^2 \right)^{1/2} = \frac{\|x\|_2}{\sqrt{n}}$$