

Homework 2

1. Let S be a subspace of $\mathbf{R}^n$. Show that $(S^\perp)^\perp = S$.
2. Let X and Y be subspaces of $\mathbf{R}^n$.
 - (a) True or False? $X \cup Y$ is a subspace of $\mathbf{R}^n$.
 - (b) True or False? $X \cap Y$ is a subspace of $\mathbf{R}^n$.
3. Let A be an $n \times k$ matrix of rank k . True or False? The $k \times k$ matrix $A^T A$ is invertible.