

## Applied Linear Algebra

Fall 2016

- (1) Show that  $n$  non-zero mutually orthogonal vectors in  $\mathbb{R}^n$  form a basis.
- (2) Let  $A$  be an  $m \times n$  matrix. Show that  $A^T A$  and  $A$  has the same nullspace.
- (3) Let  $P$  be a non-zero symmetric matrix with  $P^2 = P$ . Show that the eigenvalues of  $P$  are either 0 or 1.