Symmetric Matrices

A matrix is symmetric when $A = A^T$

Properties

$$(AA^T)^T = (A^T)^T A^T = AA^T \quad \Rightarrow \quad \text{symmetric}$$
$$(\vec{x}\vec{x}^T)^T = (\vec{x}^T)^T \vec{x}^T = \vec{x}\vec{x}^T \quad \Rightarrow \quad \text{symmetric}$$
$$(C^2)^T = (C\,C)^T = C^T C^T = C\,C = C^2 \quad \Rightarrow \quad \text{symmetric}$$