352 Quiz 7

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1. A matrix A of size n is said to be symmetric positive definite if $A = A^T$ and for any $x \in \mathbb{R}^n$, $x \neq 0$, $x^T Ax > 0$.

2. Since A is symmetric positive definite, all the eigenvalues are greater than zero. Notice that $det(A) = \prod_i \lambda_i$ where λ_i's are the eigenvalues. Therefore, we can conclude that $det(A) > 0$. Thus A is nonsingular. Thus A is invertible.

3. If we were to measure the error with the $\infty-$norm, the order of accuracy would be of order $O(\Delta x^2)$. If we were to measure the error with the 2-norm, the order of accuracy would be of order $O(\Delta x^{\frac{3}{2}})$.