# Part of Homework 3:

**I.** Let $A$ be defined by

$$A = \begin{pmatrix} 0.1 & b \\ b & 100 \end{pmatrix}.$$

Show that $A$ is positive definite if and only if $b^2 < 10$.

**II.** Decompose $A$ into submatrices:

$$A = \begin{pmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{pmatrix}.$$

Show that if $A$ is positive definite, then the submatrices $A_{11}, A_{22}$ are positive definite.