

Addendum to the Answer Key for Exam 2.

4 To test for positive semidefiniteness, it is correct to note that if A is positive ~~definite~~ semidefinite but not positive definite, then $\det A = 0$ (for then 0 must be an eigenvalue) and $\text{trace } A \geq 0$ (since $\text{trace} = \lambda_1 + \lambda_2$ with $\lambda_2 = 0$). In particular if $k = \frac{9}{2}$ then the matrix is positive semidefinite but not positive definite.