1. Solve the system $x' = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} x$ in two ways:

(a) Solve the second equation, substitute for $y$ into the first equation, and solve it.

(b) Eliminate $y$ by solving the first equation for $y$, then substitute into the second equation, getting a second order equation for $x$. Solve it, and then find $y$ from the first equation. Do your two methods give the same answer?

2. Boyce and DiPrima, Section 7.5, #7(a), #8(a), #17.


If $v$ is an eigenvector of the matrix $A$, associated with the eigenvalue $\lambda$, show that $v$ is also an eigenvector of the matrix $A^2$, associated with the eigenvalue $\lambda^2$.


5. Boyce and DiPrima, Section 7.5, #29.