QUIZ #18, 10/25/07

MATH 54, FALL 2007

Show your work and justify your answers! Feel free to use both sides.

Name:

1. (4 pts) If $\overrightarrow{v}$ is an eigenvector of an $n \times n$ matrix A with eigenvalue λ, is $\overrightarrow{v}$ an eigenvector of $3A^3 + 2A - 3I_n$ (where I_n is the $n \times n$ identity matrix)? If so, what is the associated eigenvalue?

2. (6 pts) (a) What are the eigenvalues of the transformation T from $\mathbb{R}^2$ to $\mathbb{R}^2$ given by rotation by $180°$.

(b) What are all the associated eigenvectors?

(c) Does rotation counterclockwise by $90°$ have any eigenvectors?