Practice Problems

MATH2055: Advanced Linear Algebra Tutorial 9
Eigenstuff

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(Treil 4.1.3) Compute the eigenvalues, eigenvectors, and eigenspaces for the 2D rotation matrix:

$$R := \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$$

(Treil 4.1.6) An operator is called *nilpotent* if $A^k = 0$ for some $k \in \mathbb{N}$. Show that $\theta = 0$ is the only eigenvalue for A.

(Treil 4.1.10) Prove that the determinant of a matrix A is equal to the product of its eigenvalues.