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6)Answer:

According to the definition, such eigenvalue λ exists if there is a non-zero vector v such that $(A - \lambda I)v = 0$. Thus following formula should be held that $\det(A - \lambda I) = 0$.

However, in this case, since A = [0 -1;1 0], no matter what value λ is, $(A - \lambda I)$ will always equal to A. And because $\det(A) = -1$, $\det(A - \lambda I)$ would never equal to zero. Therefore matrix A has no real eigenvalue. And eigenvector doesn't exist either.