Definitions and key facts for section 5.2

For an $n \times n$ matrix, we call

$$\det(A - \lambda I) = 0$$

the **characteristic equation** of A and $\det(A - \lambda I)$ the **characteristic polynomial** of A.

Fact: For an $n \times n$ matrix A, λ is an eigenvalue of A if and only if

1. λ satisfies the characteristic equation;
2. equivalently, λ is a *root* of the characteristic polynomial.

The **multiplicity** of λ is its algebraic multiplicity as a root of the characteristic polynomial.

Fact: If A is a triangular matrix, then the diagonal entries of A are the eigenvalues of A repeated to respect multiplicity.