

Equivalent Conditions

If A is an $n \times n$ matrix, then the statements below are equivalent.

- (1) A is invertible.
- (2) $Ax = b$ has a unique solution for every $n \times 1$ column matrix b .
- (3) $Ax = 0$ has only the trivial solution.
- (4) A is row-equivalent to I_n .
- (5) A can be written as the product of elementary matrices.