

cond() — Condition number

[Description](#)
[Diagnostics](#)
[Syntax](#)
[Also see](#)
[Remarks and examples](#)
[Conformability](#)

Description

`cond(A)` returns `cond(A, 2)`.

`cond(A, p)` returns the value of the condition number of A for the specified `norm` p , where p may be 0, 1, 2, or . (missing).

Syntax

real scalar `cond(numeric matrix A)`

real scalar `cond(numeric matrix A, real scalar p)`

Remarks and examples

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The condition number of a matrix A is

$$\mathit{cond} = \mathit{norm}(A, p) \times \mathit{norm}(A^{-1}, p)$$

These functions return missing when A is singular.

Values near 1 indicate that the matrix is well conditioned, and large values indicate ill conditioning.

Conformability

`cond(A)`:
A: $r \times c$
result: 1×1

`cond(A, p)`:
A: $r \times c$
p: 1×1
result: 1×1

Diagnostics

`cond(A, p)` aborts with error if p is not 0, 1, 2, or . (missing).

`cond(A)` and `cond(A, p)` return missing when A is singular or if A contains missing values.

`cond(A)` and `cond(A, p)` return 1 when A is void.

2 `cond()` — Condition number

`cond(A)` and `cond(A, 2)` return missing if the SVD algorithm fails to converge, which is highly unlikely; see [M-5] `svd()`.

Also see

[M-5] `norm()` — Matrix and vector norms

[M-4] **Matrix** — Matrix functions