**Title**

| epsilon() — Unit roundoff error (machine precision) |

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### Description

\( \text{epsilon}(x) \) returns the unit roundoff error in quantities of size \( \text{abs}(x) \).

### Syntax

\[
\text{real scalar \hspace{1em} epsilon(real scalar \hspace{1em} x)}
\]

### Remarks and examples

On all computers on which Stata and Mata are currently implemented—which are computers following IEEE standards—\( \text{epsilon}(1) \) is \( 1.0 \times 34 \), or about \( 2.22045 \times 16 \). This is the smallest amount by which a real number can differ from 1.

\( \text{epsilon}(x) \) is \( \text{abs}(x) \times \text{epsilon}(1) \). This is an approximation of the smallest amount by which a real number can differ from \( x \). The approximation is exact at integer powers of 2.

### Conformability

**epsilon(x):**

\[
x: \quad 1 \times 1
\]

\[
\text{result:} \quad 1 \times 1
\]

### Diagnostics

\( \text{epsilon}(x) \) returns . if \( x \) is missing.

### Also see

- [M-5] `edittozero()` — Edit matrix for roundoff error (zeros)
- [M-5] `mindouble()` — Minimum and maximum nonmissing value
- [M-4] `Utility` — Matrix utility functions