acsefunctions

Release 0.1

Your Name

Apr 19, 2025

CONTENTS

acsefunctions.special.**cosh**(*x*, *n_terms=20*)

Compute the hyperbolic cosine function cosh(x) using a Taylor series approximation.

Parameters

- **x** (*float or numpy.ndarray*) – Input value(s) for which to compute cosh(x).
- **n_terms** (*int, optional*) – Number of terms to use in the Taylor series (default is 20).

Returns

Computed cosh(x) for the input(s).

Return type

float or numpy.ndarray

Examples

```
>>> cosh(0)
1.0
>>> cosh(1)
1.5430806348152437
>>> cosh(np.array([0, 1, 2]))
array([1.        , 1.54308063, 3.76219569])
```

acsefunctions.special.**exp**(*x*, *n_terms=20*)

Compute the exponential function e^x using a Taylor series approximation.

Parameters

- **x** (*float or numpy.ndarray*) – Input value(s) for which to compute e^x.
- **n_terms** (*int, optional*) – Number of terms to use in the Taylor series (default is 20).

Returns

Computed e^x for the input(s).

Return type

float or numpy.ndarray

Examples

```
>>> exp(0)
1.0
>>> exp(1)
2.718281828459045
>>> exp(np.array([0, 1, 2]))
array([1.        , 2.71828183, 7.3890561 ])
```

acsefunctions.special.**sinh**(*x*, *n_terms=20*)

Compute the hyperbolic sine function sinh(x) using a Taylor series approximation.

Parameters

- **x** (*float or numpy.ndarray*) – Input value(s) for which to compute sinh(x).
- **n_terms** (*int, optional*) – Number of terms to use in the Taylor series (default is 20).

Returns

Computed sinh(x) for the input(s).

Return type
float or numpy.ndarray

Examples

```
>>> sinh(0)
0.0
>>> sinh(1)
1.1752011936438014
>>> sinh(np.array([0, 1, 2]))
array([0.        , 1.17520119, 3.62686041])
```

acsefunctions.special.**tanh**(*x*, *n_terms=20*)

Compute the hyperbolic tangent function tanh(x) as sinh(x) / cosh(x).

Parameters

- **x** (*float or numpy.ndarray*) – Input value(s) for which to compute tanh(x).
- **n_terms** (*int, optional*) – Number of terms to use in the Taylor series for sinh and cosh (default is 20).

Returns
Computed tanh(x) for the input(s).

Return type
float or numpy.ndarray

Raises
ZeroDivisionError – If cosh(x) equals zero, which can occur in rare numerical edge cases.

Examples

```
>>> tanh(0)
0.0
>>> tanh(1)
0.7615941559557649
>>> tanh(np.array([0, 1, 2]))
array([0.        , 0.76159416, 0.96402758])
```

PYTHON MODULE INDEX

a

INDEX