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## scipy.integrate.trapz

**scipy.integrate.trapz**(*y*, *x=None*, *dx=1.0*, *axis=-1*)

Integrate along the given axis using the composite trapezoidal rule.

Integrate  $y(x)$  along given axis.

**Parameters:**    *y* : **array\_like**

Input array to integrate.

*x* : **array\_like, optional**

The sample points corresponding to the  $y$  values. If  $x$  is `None`, the sample points are assumed to be evenly spaced  $dx$  apart. The default is `None`.

*dx* : **scalar, optional**

The spacing between sample points when  $x$  is `None`. The default is 1.

*axis* : **int, optional**

The axis along which to integrate.

**Returns:**    *trapz* : **float**

Definite integral as approximated by trapezoidal rule.

### See also:

**sum** (<https://docs.python.org/dev/library/functions.html#sum>), **cumsum**

### Notes

Image [2] illustrates trapezoidal rule –  $y$ -axis locations of points will be taken from  $y$  array, by default  $x$ -axis distances between points will be 1.0, alternatively they can be provided with  $x$  array or with  $dx$  scalar. Return value will be equal to combined area under the red lines.

### References

[1] Wikipedia page: [http://en.wikipedia.org/wiki/Trapezoidal\\_rule](http://en.wikipedia.org/wiki/Trapezoidal_rule)  
([http://en.wikipedia.org/wiki/Trapezoidal\\_rule](http://en.wikipedia.org/wiki/Trapezoidal_rule))

[2] (1, 2) Illustration image:  
[http://en.wikipedia.org/wiki/File:Composite\\_trapezoidal\\_rule\\_illustration.png](http://en.wikipedia.org/wiki/File:Composite_trapezoidal_rule_illustration.png)  
([http://en.wikipedia.org/wiki/File:Composite\\_trapezoidal\\_rule\\_illustration.png](http://en.wikipedia.org/wiki/File:Composite_trapezoidal_rule_illustration.png))