
Subject: Re: How to calculate the curve area?

Posted by [Paul Van Delst\[1\]](#) on Tue, 21 Jun 2005 20:30:32 GMT

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Julio wrote:

> Hi Benjamin.

>

> The total command returns me returns the sum of the elements of an
> array. However, I need to find the area of the curve.

>

> I found the TSUM.PRO routine (see below), it calculates the integrated
> area of a curve. I think it is what I need,

> Thanks at any rate,

> Julio

>

> <http://idlastro.gsfc.nasa.gov/ftp/pro/math/tsum.pro>

>

You could use the INT_TABULATED IDL function.

Or use Simpson's rule. I have a integral.pro routine that does this. From the header:

```
; CALLING SEQUENCE:
```

```
;   result = integral( x, y )
```

```
;
```

```
; INPUTS:
```

```
;   x: Vector of abscissa points. Elements must be unique and monotonically  
;       increasing.
```

```
;
```

```
;   y: Vector of corresponding ordinate points.
```

```
;
```

```
; EXAMPLE:
```

```
;   Define 11 x-values on the closed interval [0.0 , 0.8].
```

```
;
```

```
;   IDL> x = [ 0.0, .12, .22, .32, .36, .40, .44, .54, .64, .70, .80 ]
```

```
;
```

```
;   Define 11 f-values corresponding to x(i).
```

```
;
```

```
;   IDL> f = [ 0.200000, 1.30973, 1.30524, 1.74339, 2.07490, 2.45600, $
```

```
;   IDL>   2.84299, 3.50730, 3.18194, 2.36302, 0.231964 ]
```

```
;
```

```
;   Compute the integral:
```

```
;
```

```
;   IDL> result = integral( x, f )
```

```
;   IDL> HELP, result
```

```
;   RESULT      DOUBLE   =      1.6274544
```

```
;
```

```
;   In this example, the f-values are generated from a known function,
```

```
; (f = .2 + 25*x - 200*x^2 + 675*x^3 - 900*x^4 + 400*x^5)
;
;
; The Multiple Application Trapezoid Method yields; result = 1.5648
; The Multiple Application Simpson's Method yields; result = 1.6036
; IDL User Library INT_TABULATED.PRO yields; result = 1.6232
; INTEGRAL.PRO yields; result = 1.6274
; The Exact Solution (4 decimal accuracy) yields; result = 1.6405
```

paulv

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