

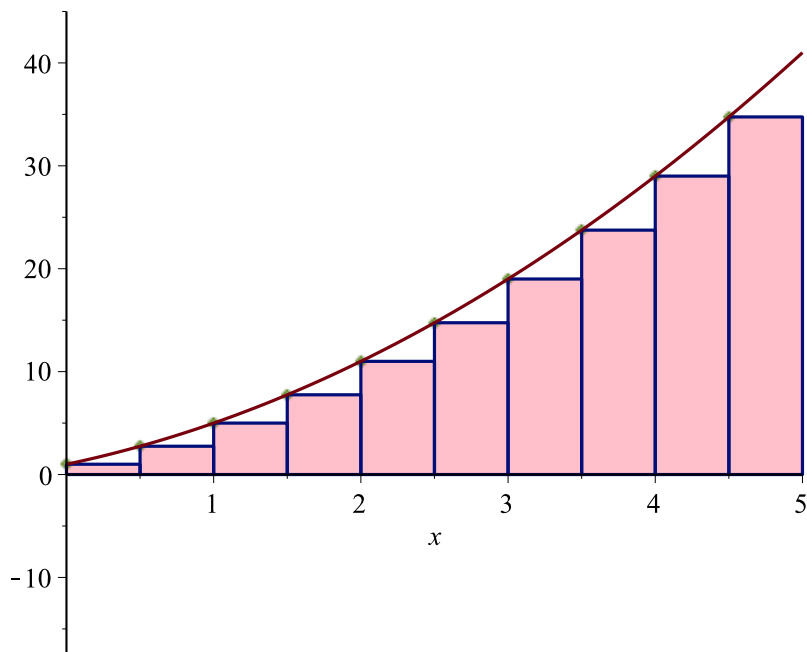
Summer og Riemannsummer i Maple

Maple kan brukes til å approksimere funksjoner med øvre og nedre

Riemannsummer. Til dette bruker vi pakken Student[Calculus1] :

`with(Student[Calculus1]) :`

```
RiemannSum( $x^2 + 3x + 1$ ,  $x = 0 .. 5$ ,  $method = lower$ ,  $output = plot$ ,  $boxoptions = [filled = [color = pink,$   
 $transparency = .5]]$ );
```



A lower Riemann sum approximation of $\int_0^5 f(x) dx$, where

$f(x) = x^2 + 3x + 1$ and the partition is uniform. The approximate value of the integral is 74.37500000. Number of subintervals used: 10.

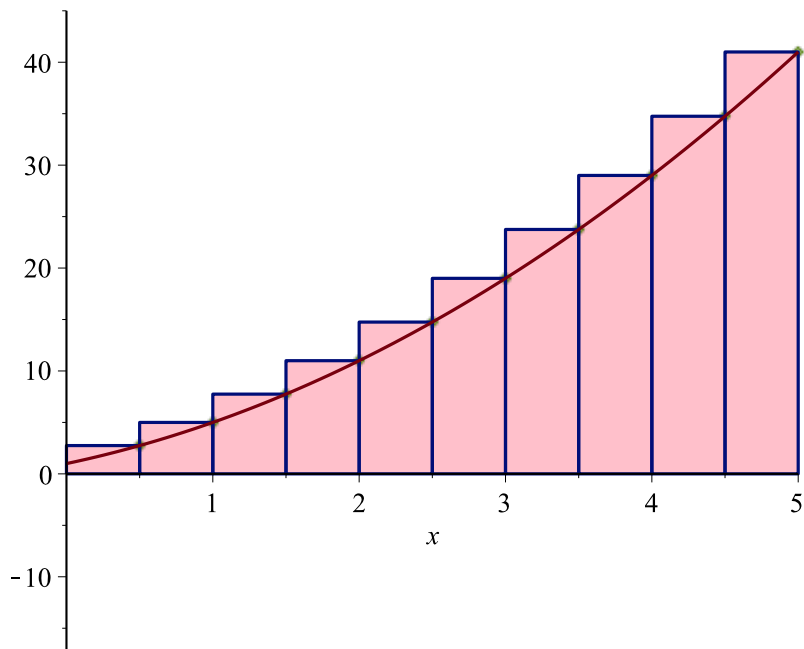
Øvre og nedre Riemannsummer angis med kommandoen `method`

`= lower`

`/upper`.

```
RiemannSum( $x^2 + 3x + 1$ ,  $x = 0 .. 5$ ,  $method = upper$ ,  $output = plot$ ,  $boxoptions = [filled = [color = pink,$ 
```

```
transparency = .5]]);
```

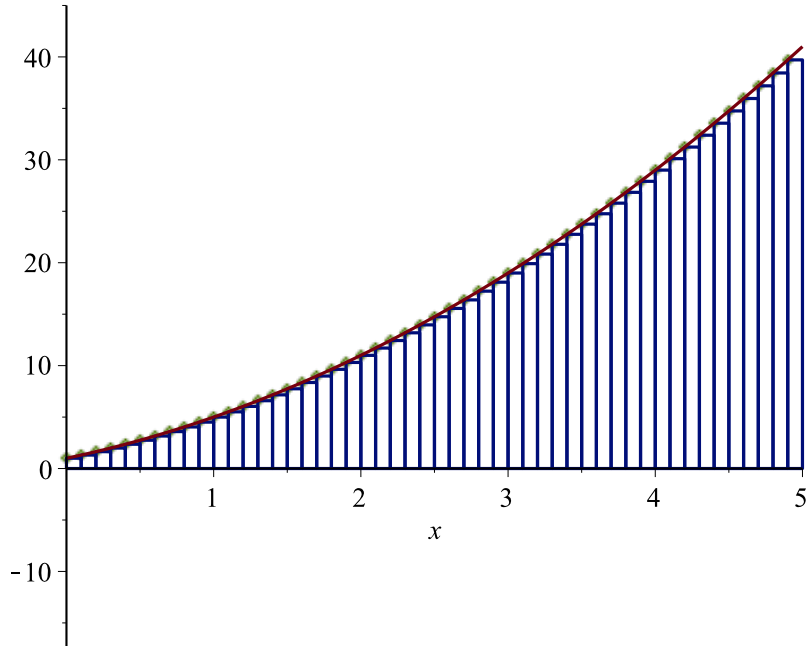


An upper Riemann sum approximation of $\int_0^5 f(x) dx$, where $f(x) = x^2 + 3x + 1$ and the partition is uniform. The approximate value of the integral is 94.37500000. Number of subintervals used: 10.

En kan selv velge antall partisjoner

. Merk at vi får en bedre tilnærming til arealet under grafen her :

```
RiemannSum(x2 + 3 x + 1, x = 0 ..5, method = lower, output = plot, partition = 50);
```



A lower Riemann sum approximation of $\int_0^5 f(x) dx$, where $f(x) = x^2 + 3x + 1$ and the partition is uniform. The approximate value of the integral is 82.17500000. Number of subintervals used: 50.

Maple kan også brukes til å regne ut summer :

$$\sum_{i=0}^{13} i^2$$

819

(1)

Eller finne lukkede former for summer.

$$\sum_{i=0}^n i^2$$

$$\frac{1}{3} (n+1)^3 - \frac{1}{2} (n+1)^2 + \frac{1}{6} n + \frac{1}{6}$$

(2)

simplify(%)

$$\frac{1}{3} n^3 + \frac{1}{2} n^2 + \frac{1}{6} n$$

(3)

