```
> restart;
```

```
> f(t):=10*cosh(t/2);
```

$$f(t) := 10 \cosh\left(\frac{1}{2}\, t\right) \tag{1}$$

```
> n:=4;
```

$$n := 4 \tag{2}$$

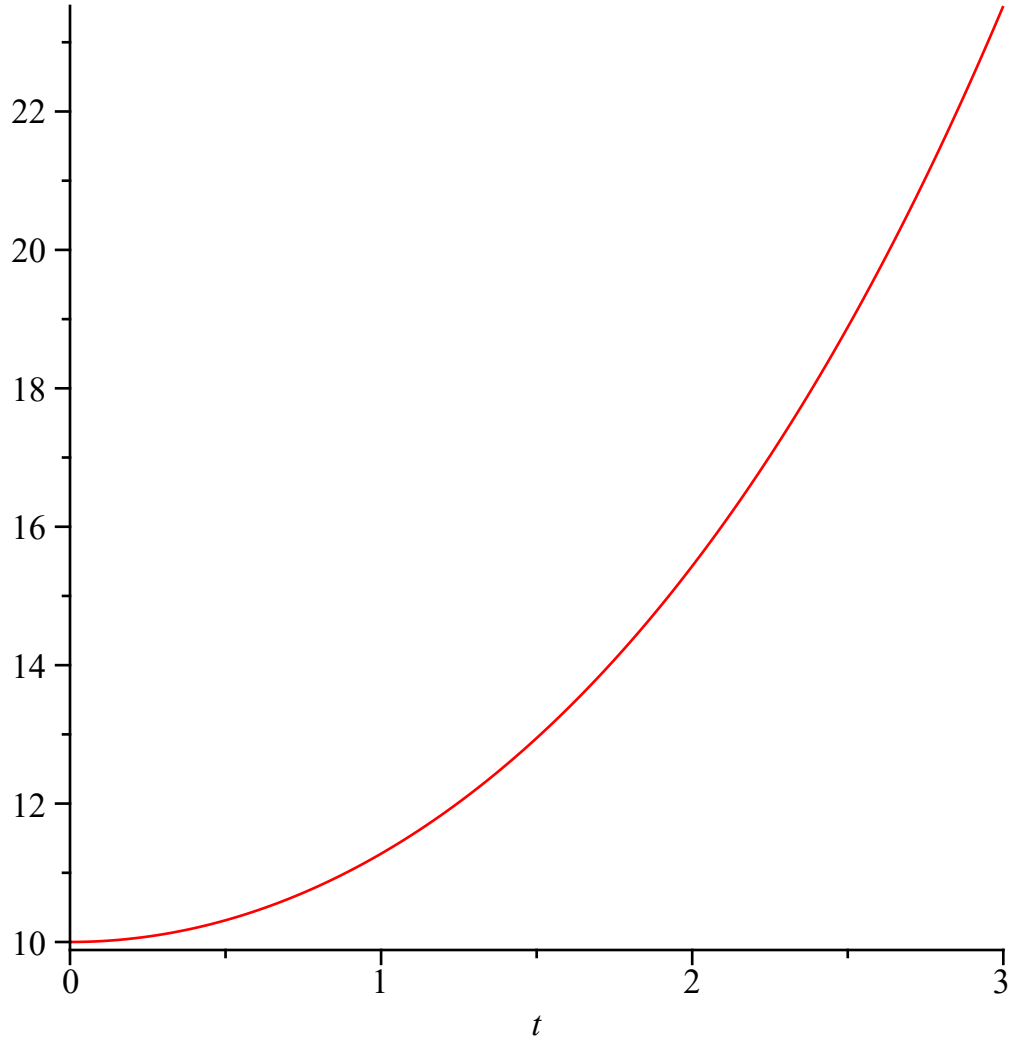
```
> a:=0;
```

$$a := 0 \tag{3}$$

```
> b:=3;
```

$$b := 3 \tag{4}$$

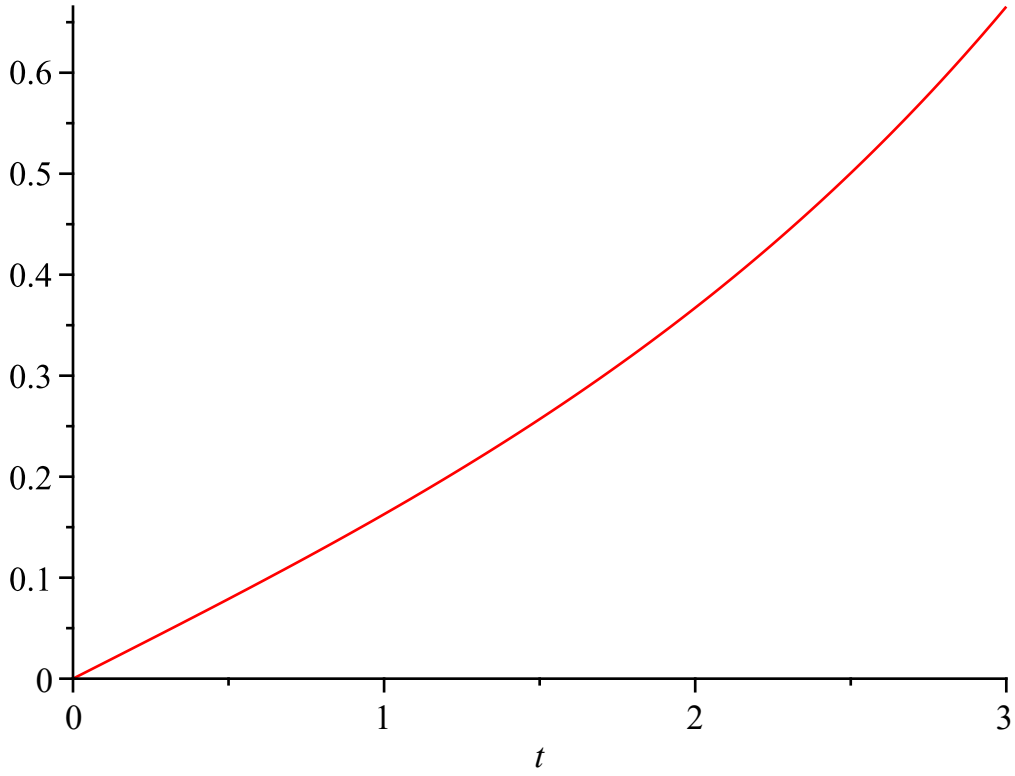
```
> plot(f(t), t=a..b);
```




```
> df(t):=diff(f(t),t$n+1);
```

$$df(t) := \frac{5}{16}\sinh\left(\frac{1}{2}\,t\right) \tag{5}$$

```
> plot(df(t),t=a..b);
```




```
> M:=evalf(maximize(abs(diff(f(t),t$n+1)),t=a..b));
```

$$M := 0.6653998297 \tag{6}$$

```
> h:=(b-a)/n;
```

$$h := \frac{3}{4} \tag{7}$$

```
> w:=t-a;
```

$$w := t \tag{8}$$

```
> for i from 1 to n do w:=w*(t-a-i*h) end do;
```

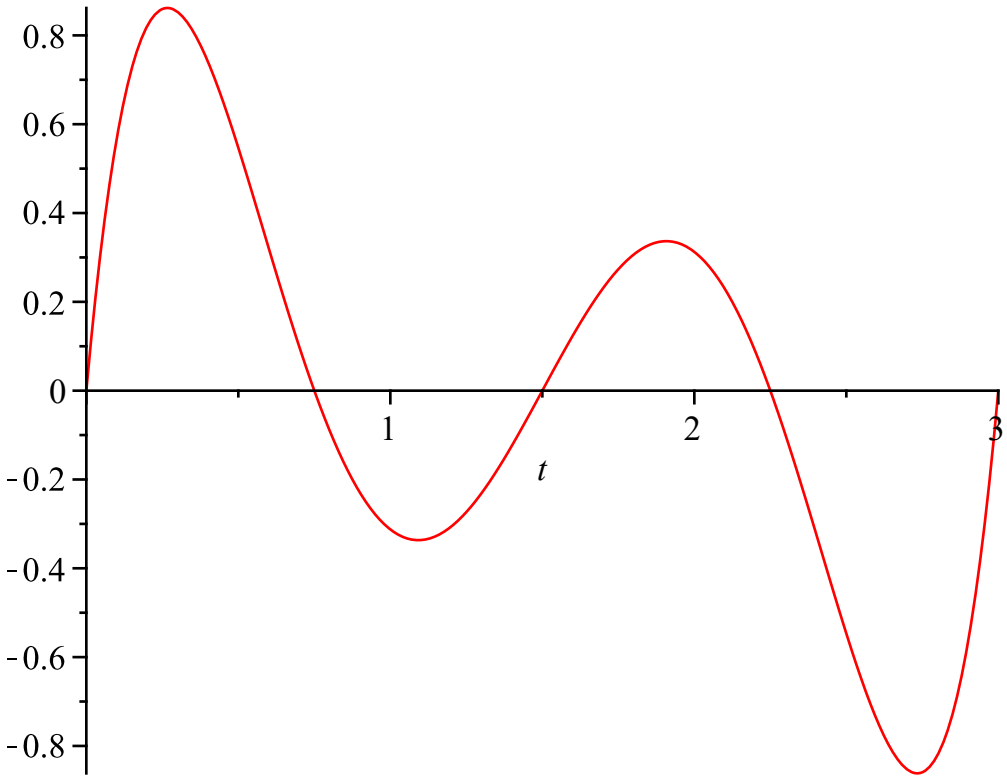
$$w := t\left(t-\frac{3}{4}\right)$$

$$w := t\left(t-\frac{3}{4}\right)\left(t-\frac{3}{2}\right)$$

$$w := t\left(t-\frac{3}{4}\right)\left(t-\frac{3}{2}\right)\left(t-\frac{9}{4}\right)$$

$$w := t\left(t-\frac{3}{4}\right)\left(t-\frac{3}{2}\right)\left(t-\frac{9}{4}\right)(t-3) \tag{9}$$

```
> plot(w,t=a..b);
```




```
> Wmax:=evalf(maximize(abs(w),t=a..b));
```

$$Wmax := 0.8617558852 \tag{10}$$

```
> R:=M*Wmax/(n+1)!;
```

$$R := 0.004778435161 \tag{11}$$

```
> R4:=M*w/(n+1)!;
```

$$R4 := 0.005544998581\, t \left(t - \frac{3}{4}\right) \left(t - \frac{3}{2}\right) \left(t - \frac{9}{4}\right) (t - 3) \tag{12}$$

```
> R_calc := proc(M, a, b, n, t )
      h := ( b - a)/n :
      w := evalf(t - a) :
      for i from 1 to n do w := evalf(w* (t - a - i* h)) end do:
      R := M·w/(n + 1)!

   end proc:
Warning, `h` is implicitly declared local to procedure `R_calc`
Warning, `w` is implicitly declared local to procedure `R_calc`
Warning, `i` is implicitly declared local to procedure `R_calc`
Warning, `R` is implicitly declared local to procedure `R_calc`
>
   Rn(0.3) = R_calc(M, a, b, n, 0.3);
   Rn(0.5) = R_calc(M, a, b, n, 0.5);
   Rn(1.75) = R_calc(M, a, b, n, 1.75);
```

$$Rn(a+h) = R\_calc(M, a, b, n, a+h);$$

$$Rn(0.3) = 0.004729495639$$
$$Rn(0.5) = 0.003032421099$$
$$Rn(1.75) = 0.001516210549$$
$$Rn\left(\frac{3}{4}\right) = -0. \qquad \textbf{(13)}$$

>