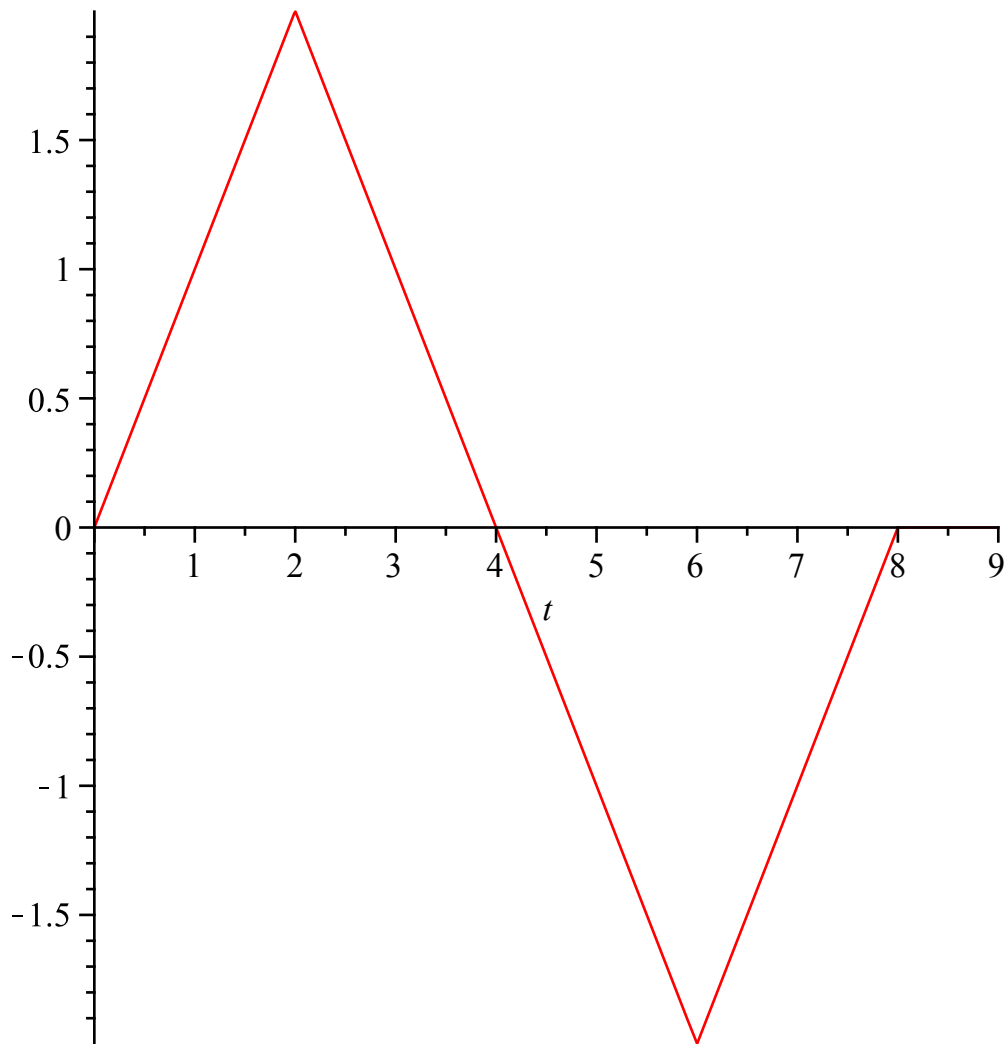


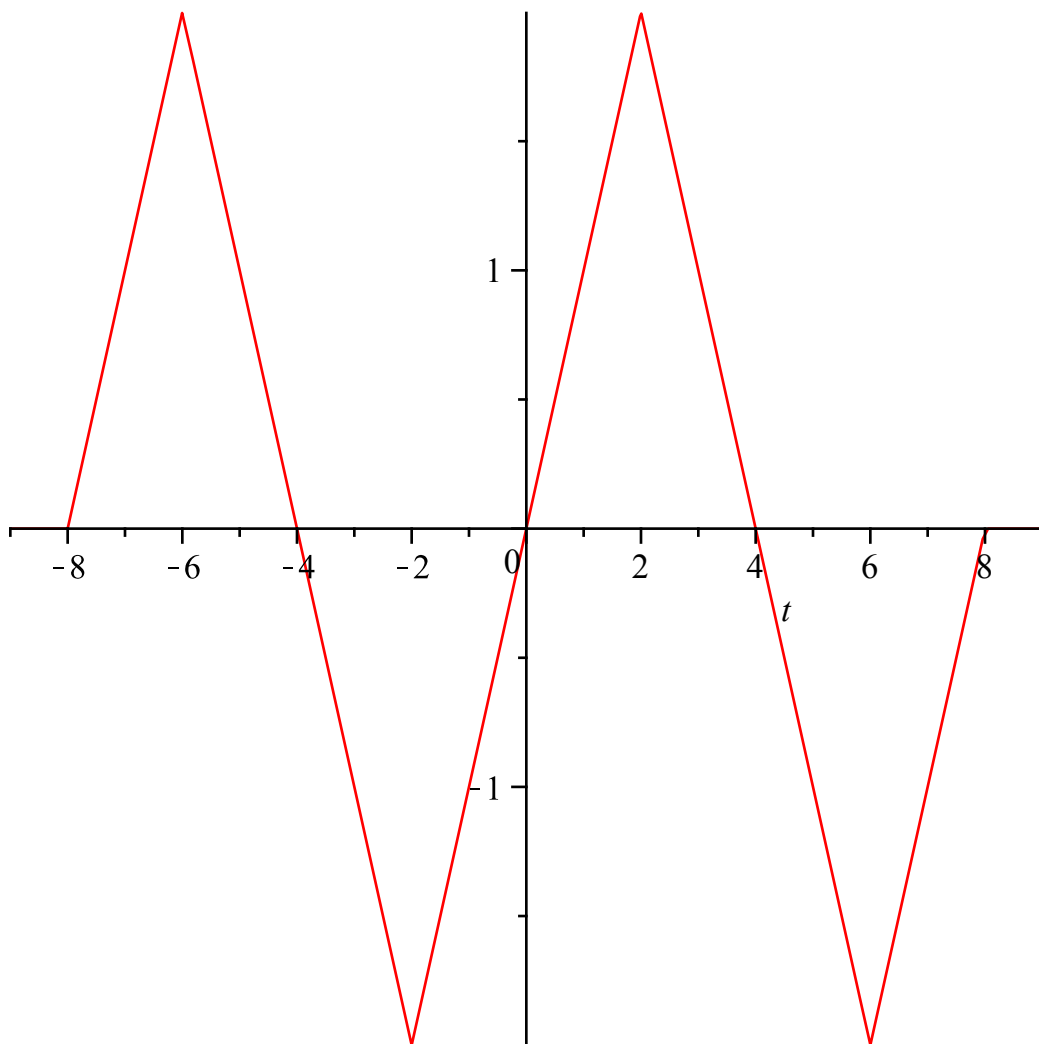
```
> restart
```

```
> f(t) := t·Heaviside(t) - 2·(t - 2)·Heaviside(t - 2) + 2·(t - 6)·Heaviside(t - 6) - (t - 8)·Heaviside(t - 8) : plot(f(t), t=0..9)
```



```
> g(t) := (t + 8)·Heaviside(t + 8) - 2·(t + 6)·Heaviside(t + 6) + 2·(t + 2)·Heaviside(t + 2) - t·Heaviside(t) + f(t); plot(g(t), t=-9..9)
```

```
g(t) := (t + 8) Heaviside(t + 8) - 2 (t + 6) Heaviside(t + 6) + 2 (t + 2) Heaviside(t + 2) - 2 (t - 2) Heaviside(t - 2) + 2 (t - 6) Heaviside(t - 6) - (t - 8) Heaviside(t - 8)
```



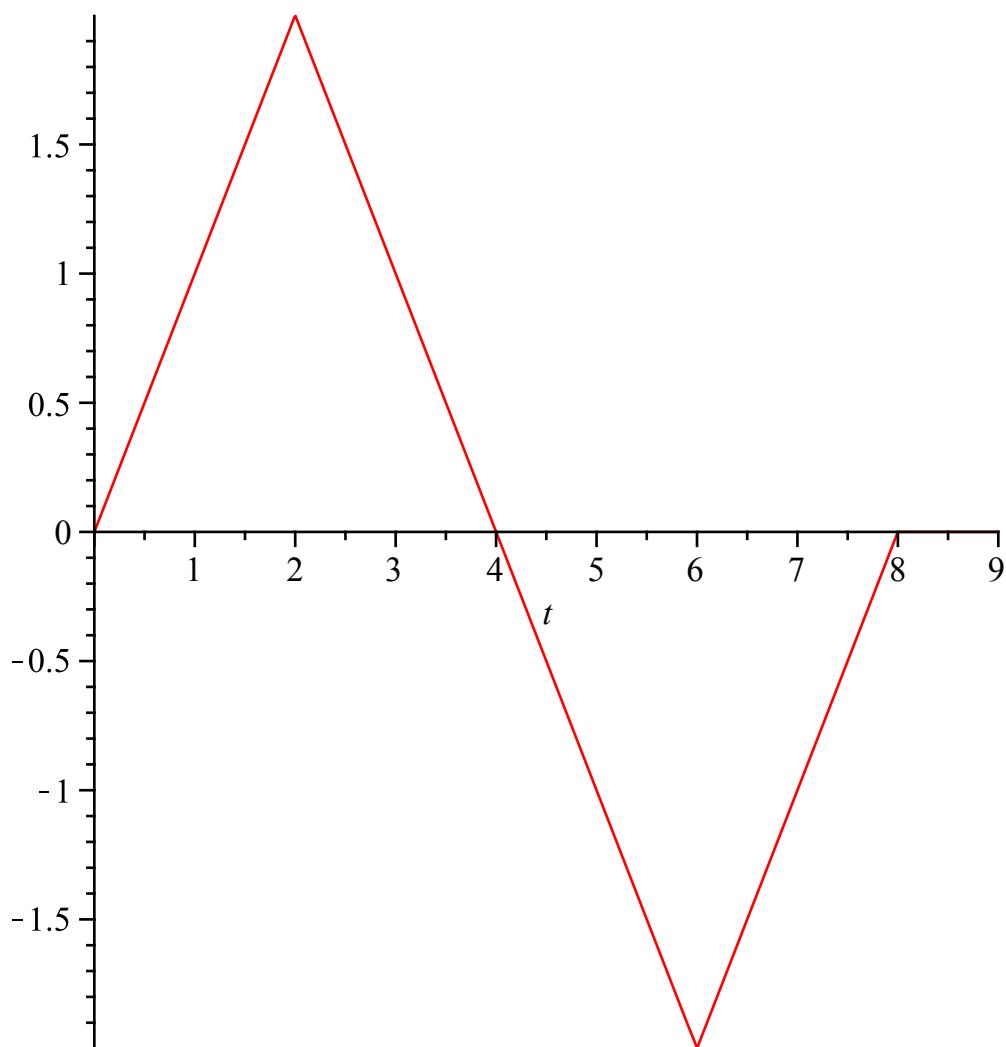
```
> L := 9;
L := 9 (1)
```

```
> a_0 := (1/L) * int(g(t), t = -L..L)
a_0 := 0 (2)
```

```
> b_n := simplify((1/L) * int(g(t) * sin(n * Pi * t / L), t = -L..L));
b_n := (18 * (sin(8/9 * n * Pi) - 2 * sin(2/3 * n * Pi) + 2 * sin(2/9 * n * Pi))) / (n^2 * Pi^2) (3)
```

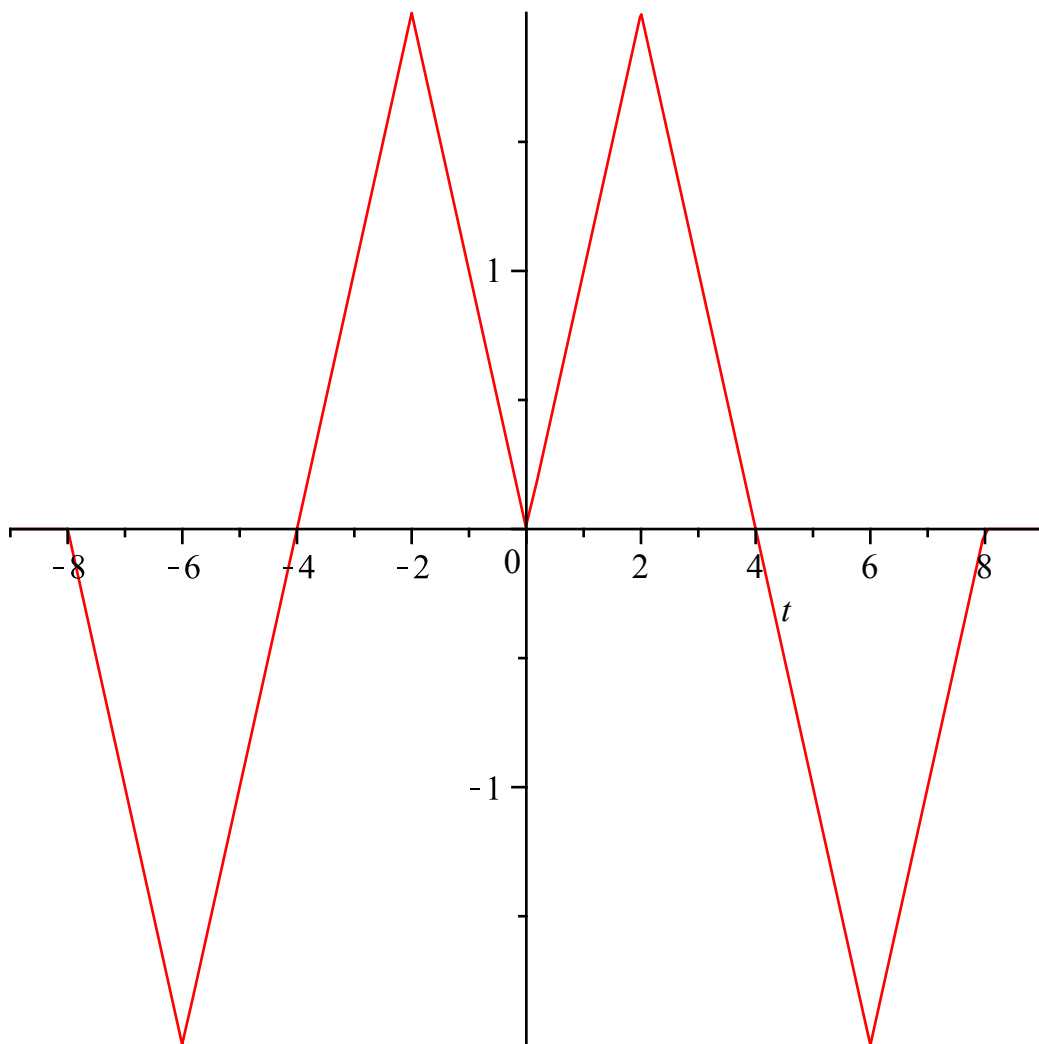
```
> STF_1000 := sum(b_n * sin(n * Pi * t / L), n = 1..1000) :
```

```
> plot(STF_1000, t = 0..L);
```



$$h(t) := -(t + 8) \cdot \text{Heaviside}(t + 8) + 2 \cdot (t + 6) \cdot \text{Heaviside}(t + 6) - 2 \cdot (t + 2) \cdot \text{Heaviside}(t + 2) + t \cdot \text{Heaviside}(t) + f(t); \text{plot}(h(t), t = -9..9)$$

$$h(t) := -(t + 8) \text{ Heaviside}(t + 8) + 2 (t + 6) \text{ Heaviside}(t + 6) - 2 (t + 2) \text{ Heaviside}(t + 2) + 2 t \text{ Heaviside}(t) - 2 (t - 2) \text{ Heaviside}(t - 2) + 2 (t - 6) \text{ Heaviside}(t - 6) - (t - 8) \text{ Heaviside}(t - 8)$$



$$\begin{aligned} &> b_n := \text{simplify}\left(\left(\frac{1}{L}\right) \cdot \text{int}\left(h(t) \cdot \sin\left(\frac{n \cdot \text{Pi} \cdot t}{L}\right), t = -L..L\right)\right) \\ &\quad b_n := 0 \end{aligned} \tag{4}$$

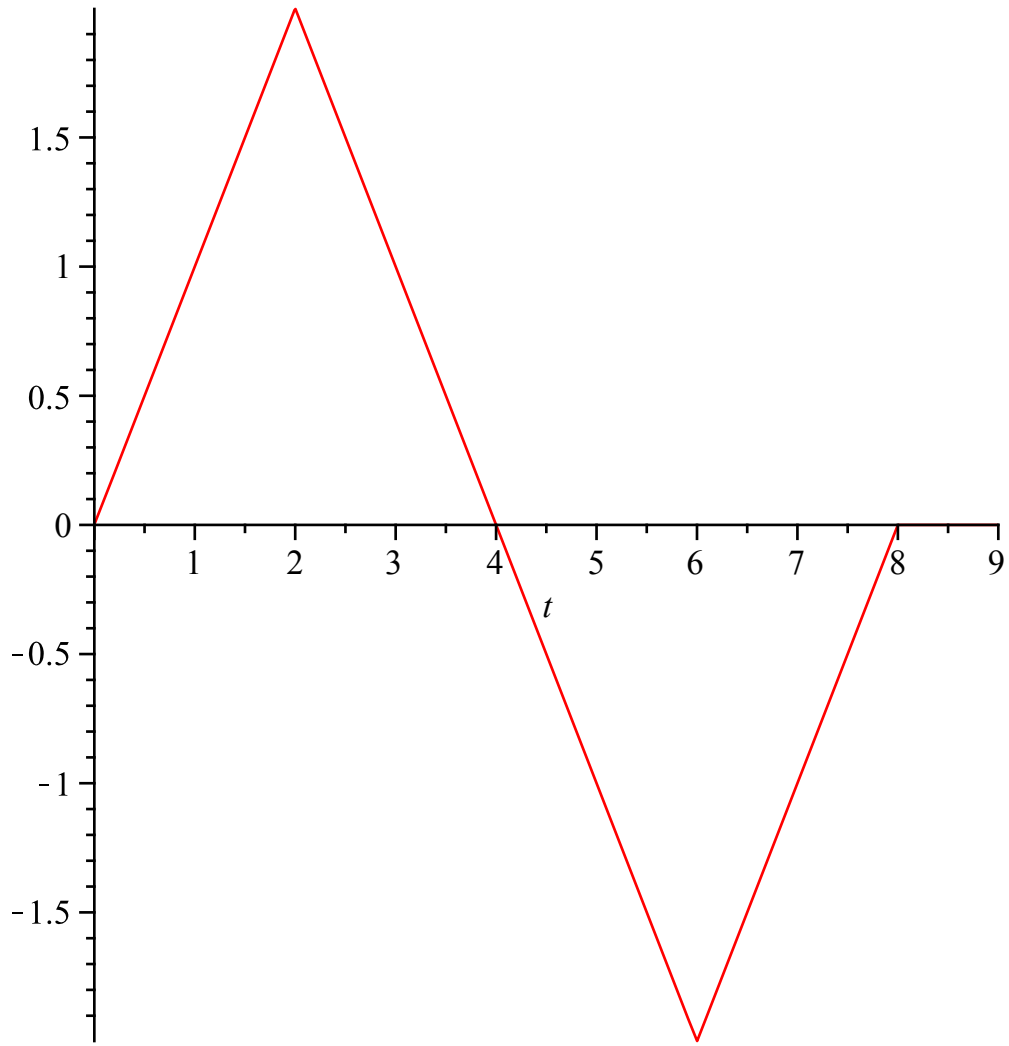
$$\begin{aligned} &> a_0 := \left(\frac{1}{L}\right) \cdot \text{int}(h(t), t = -L..L) \\ &\quad a_0 := 0 \end{aligned} \tag{5}$$

$$\begin{aligned} &> C := \frac{a_0}{2}; \\ &\quad C := 0 \end{aligned} \tag{6}$$

$$\begin{aligned} &> a_n := \text{simplify}\left(\left(\frac{1}{L}\right) \cdot \text{int}\left(h(t) \cdot \cos\left(\frac{n \cdot \text{Pi} \cdot t}{L}\right), t = -L..L\right)\right) \\ &\quad a_n := \frac{18 \left(2 \cos\left(\frac{2}{9} n \pi\right) - 2 \cos\left(\frac{2}{3} n \pi\right) - 1 + \cos\left(\frac{8}{9} n \pi\right)\right)}{n^2 \pi^2} \end{aligned} \tag{7}$$

$$> STTF_{1000} := C + \text{sum}\left(a_n \cdot \cos\left(\frac{n \cdot \text{Pi} \cdot t}{L}\right), n = 1..1000\right) :$$

$$> \text{plot}(STTF_{1000}, t = 0..L);$$



> $LL := 4;$

$LL := 4$

(8)

> $aa_0 := \left(\frac{1}{LL} \right) \cdot \text{int}(f(t), t=0 .. 2 \cdot LL);$

$aa_0 := 0$

(9)

> $aa_n := \left(\frac{1}{LL} \right) \cdot \text{int} \left(f(t) \cdot \cos \left(\frac{n \cdot \text{Pi} \cdot t}{LL} \right), t=0 .. 2 \cdot LL \right);$

$$aa_n := \frac{1}{4} \frac{32 \cos(n \pi)^2 - 32 - 32 \cos\left(\frac{3}{2} n \pi\right) + 32 \cos\left(\frac{1}{2} n \pi\right)}{n^2 \pi^2}$$

(10)

> $bb_n := \left(\frac{1}{LL} \right) \cdot \text{int} \left(f(t) \cdot \sin \left(\frac{n \cdot \text{Pi} \cdot t}{LL} \right), t=0 .. 2 \cdot LL \right);$

$$bb_n := \frac{1}{4} \frac{32 \sin(n \pi) \cos(n \pi) + 32 \sin\left(\frac{1}{2} n \pi\right) - 32 \sin\left(\frac{3}{2} n \pi\right)}{n^2 \pi^2}$$

(11)

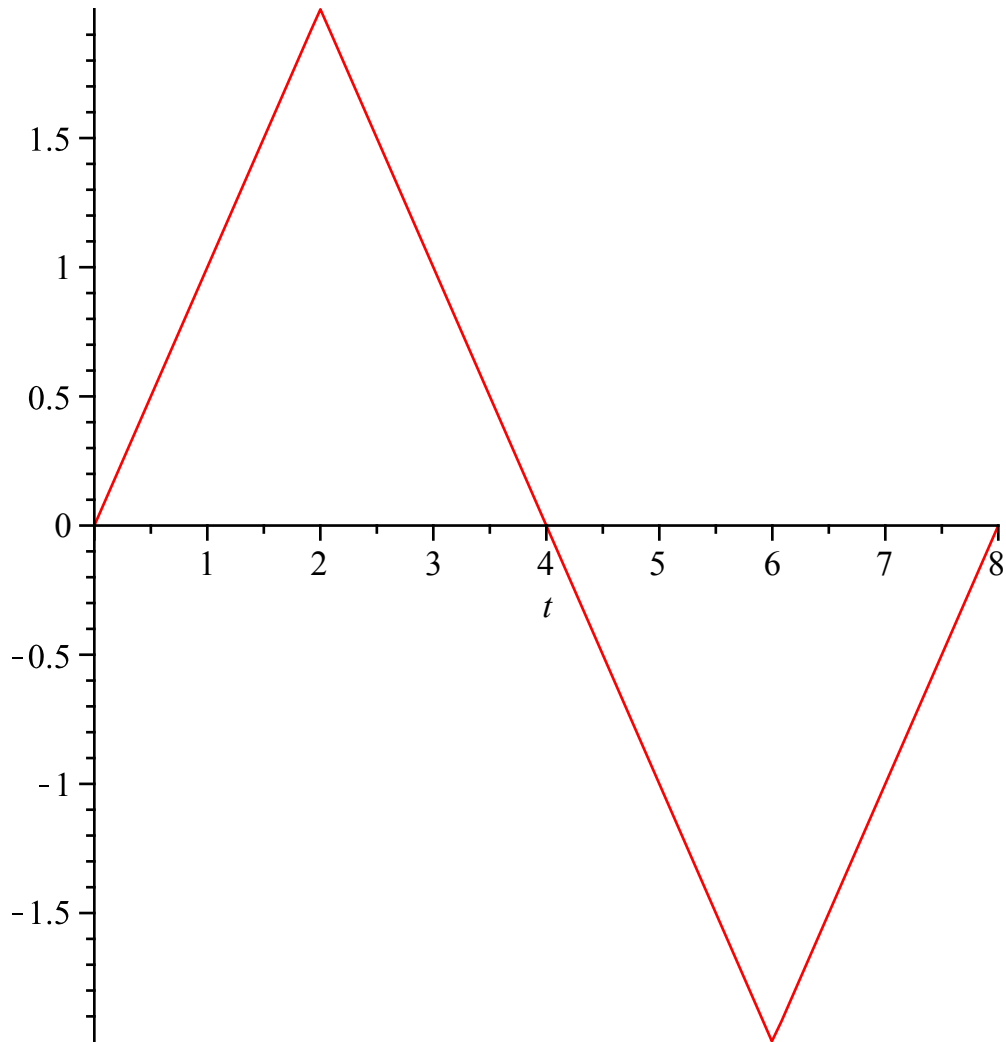
> $CC := \frac{aa_0}{2};$

(12)

$CC := 0$

(12)

```
> STFF500 := CC + sum( $aa_n \cdot \cos\left(\frac{n \cdot \text{Pi} \cdot t}{LL}\right) + bb_n \cdot \sin\left(\frac{n \cdot \text{Pi} \cdot t}{LL}\right)$ ,  $n = 1 \dots 500$ ):  
> plot(STFF500,  $t = 0 \dots 2 \cdot LL$ );
```



```
>  
>  
>  
>  
>  
>
```