```
> # Compute and plot full sine and cosine series, sine series,
  cosine series
> L:=1;f:=x->1+x;
```

$$L := 1 \tag{1}$$

```
> # Truncated sine series S(x,n)
> B:=n->(2/L)*int(f(x)*sin(n*Pi*x/L),x=0..L);
```

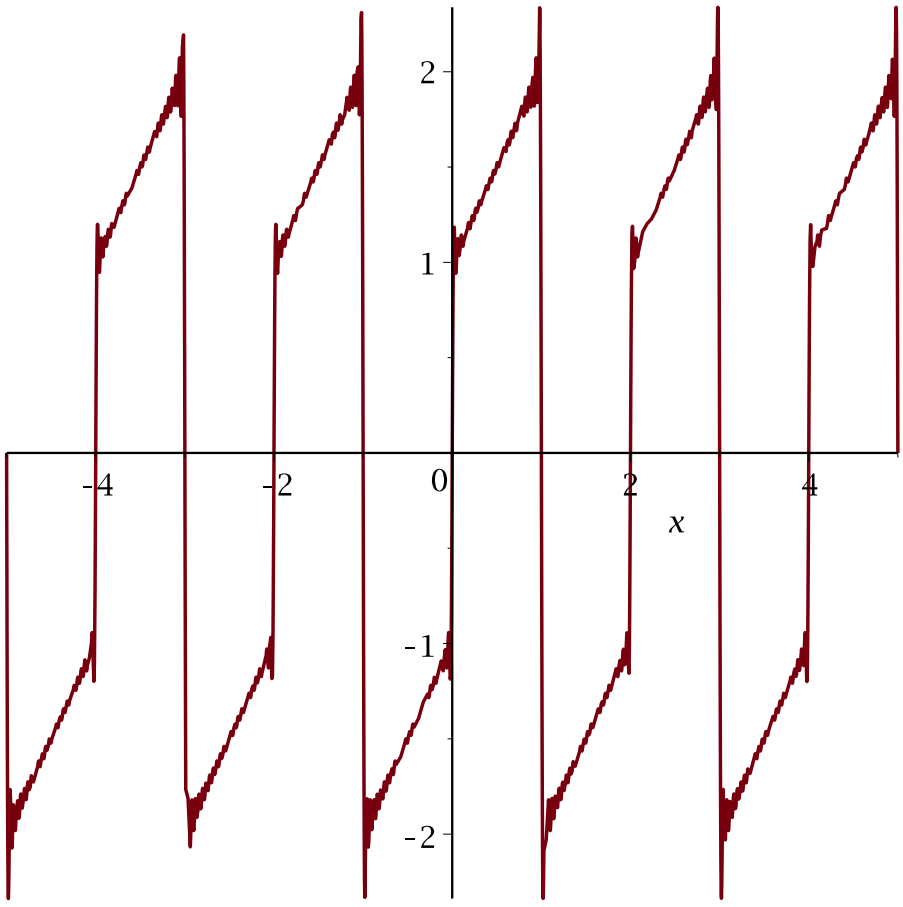
$$B := n \to \frac{2\left(\int_0^L f(x)\sin\left(\frac{n\pi x}{L}\right)\,dx\right)}{L} \tag{2}$$

$$f := x \to 1 + x \tag{3}$$

```
> S:=(x,n)->sum(B(k)*sin(k*Pi*x/L),k=1..n);
```

$$S := (x, n) \to \sum_{k=1}^{n} B(k)\sin\left(\frac{k\pi x}{L}\right) \tag{4}$$

```
> plot(S(x,50),x=-5*L..5*L);
```




```
> A:=n->(2/L)*int(f(x)*cos(n*Pi*x/L),x=0..L);
```

$$A := n \rightarrow \frac{2\left(\int_0^L f(x)\cos\left(\frac{n\pi x}{L}\right)\,dx\right)}{L} \tag{5}$$

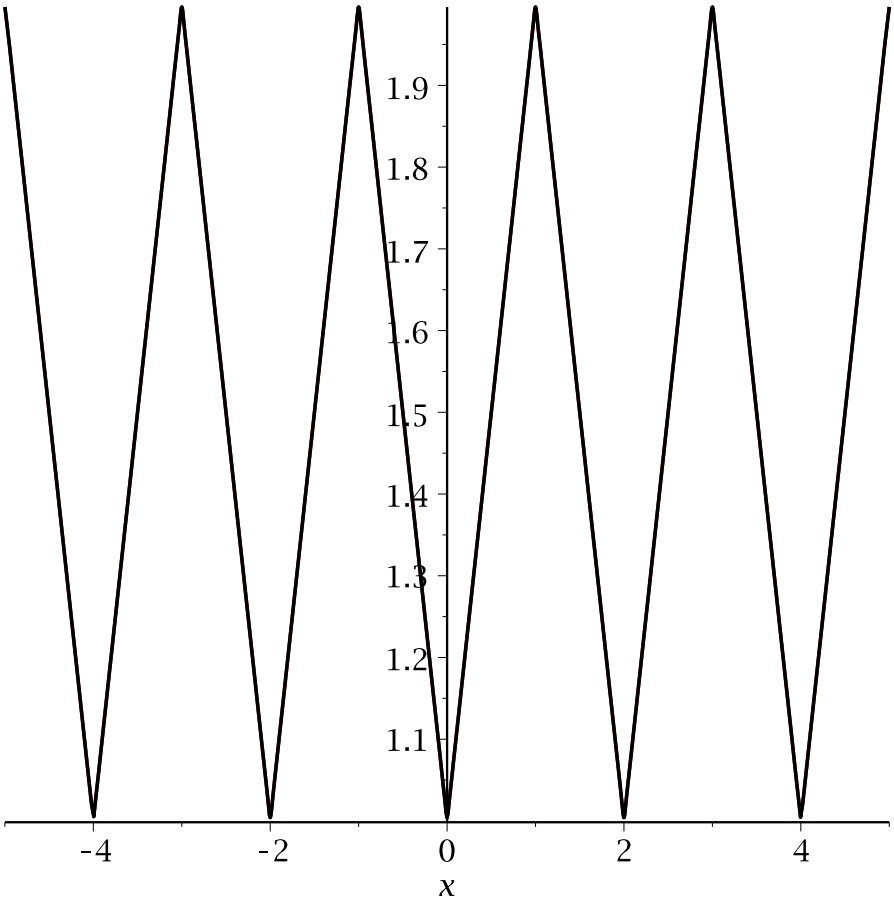
```
> A0:=(1/L)*int(f(x),x=0..L);
```

$$A0 := \frac{3}{2} \tag{6}$$

```
> # Truncated cosine series T(x,n)
> T:=(x,n)->A0+sum(A(k)*cos(k*Pi*x/L),k=1..n);
```

$$T := (x, n) \rightarrow A0 + \sum_{k=1}^{n} A(k)\cos\left(\frac{k\pi x}{L}\right) \tag{7}$$

```
> plot(T(x,50),x=-5*L..5*L);
```




```
> # # Truncated full Fourier sine and cosine series R(x,n)
> a:=n->(2/2*L)*int(f(x)*cos(n*Pi*x/L),x=-L..L);a0:=(1/(2*L))*int(f
  (x),x=-L..L);
```

$$a := n \to L\left(\int_{-L}^{L} f(x)\cos\left(\frac{n\pi x}{L}\right) dx\right)$$

$$a0 := 1 \tag{8}$$

```
> b:=n->(2/(2*L))*int(f(x)*sin(n*Pi*x/L),x=-L..L);
```

$$b := n \to \frac{\int_{-L}^{L} f(x)\sin\left(\frac{n\pi x}{L}\right) dx}{L} \tag{9}$$

```
> R:=(x,n)->a0+sum(a(k)*cos(k*Pi*x/L),k=1..n)+sum(b(k)*sin(k*Pi*
  x/L),k=1..n);
```

$$R := (x, n) \to a0 + \sum_{k=1}^{n} a(k)\cos\left(\frac{k\pi x}{L}\right) + \sum_{k=1}^{n} b(k)\sin\left(\frac{k\pi x}{L}\right) \tag{10}$$

```
> plot(R(x,50),x=-5*L..5*L);
```