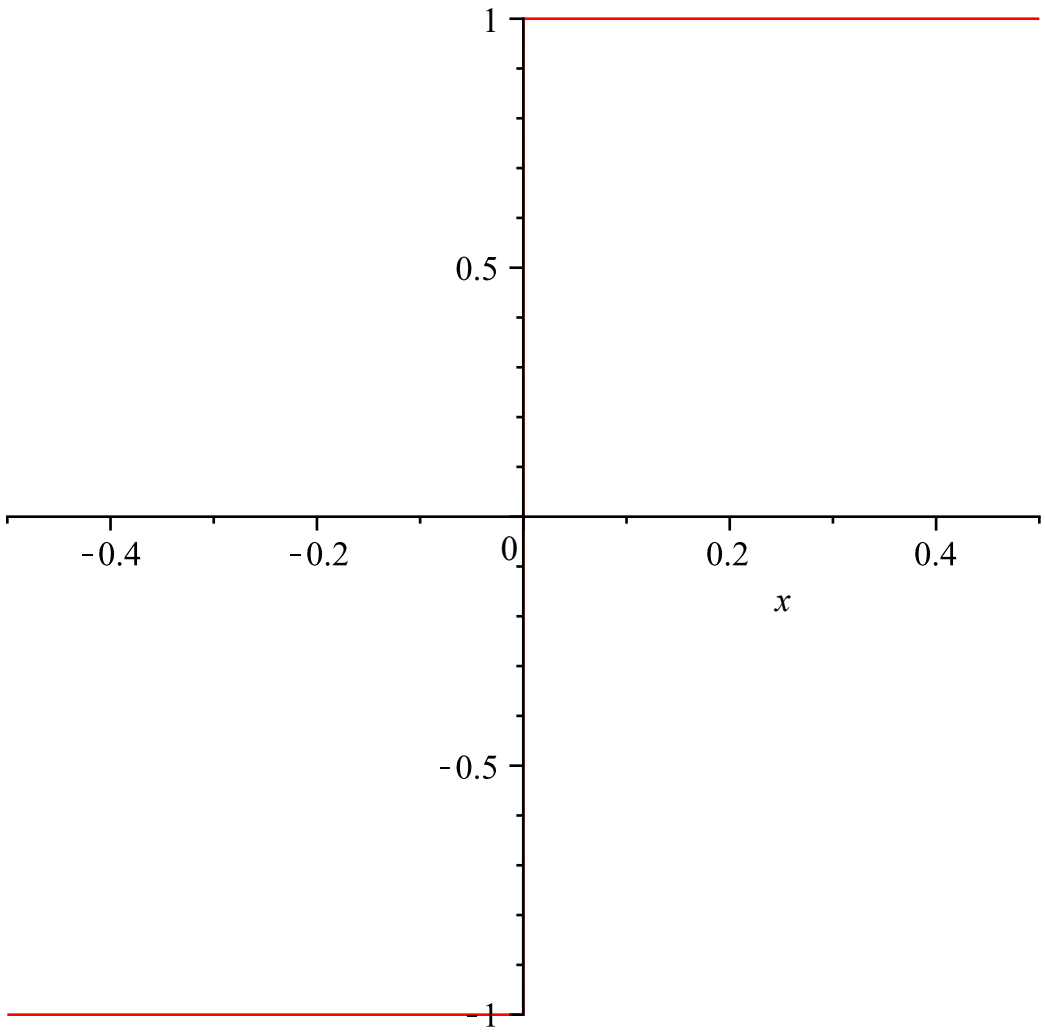
```
> f := piecewise(x < 0, -1, 1);
```

$$f := \begin{cases} -1 & x < 0 \\ 1 & otherwise \end{cases} \quad (1)$$

```
> plot(f,x=-0.5..0.5);
```




```
> b := proc(n)
  2*(1-(-1)^n)/(Pi*n)
  end proc:
> map(b,[seq(t,t=1..20)]);
```

$$\left[\frac{4}{\pi}, 0, \frac{4}{3\pi}, 0, \frac{4}{5\pi}, 0, \frac{4}{7\pi}, 0, \frac{4}{9\pi}, 0, \frac{4}{11\pi}, 0, \frac{4}{13\pi}, 0, \frac{4}{15\pi}, 0, \frac{4}{17\pi}, 0, \frac{4}{19\pi}, 0\right] \quad (2)$$

```
> std_sum := proc(N)
  local out, k;
  out := 0;
  for k from 1 to N do
  out := out + b(k)*sin(2*Pi*k*x)
  end do;
  out
  end proc:
> s5 := std_sum(5);
```

$$s5 := \frac{4\sin(2\pi x)}{\pi} + \frac{4}{3}\frac{\sin(6\pi x)}{\pi} + \frac{4}{5}\frac{\sin(10\pi x)}{\pi} \quad (3)$$

```
> s9 := std_sum(9);
```

$$s9 := \frac{4\sin(2\pi x)}{\pi} + \frac{4}{3}\frac{\sin(6\pi x)}{\pi} + \frac{4}{5}\frac{\sin(10\pi x)}{\pi} + \frac{4}{7}\frac{\sin(14\pi x)}{\pi} + \frac{4}{9}\frac{\sin(18\pi x)}{\pi} \quad (4)$$

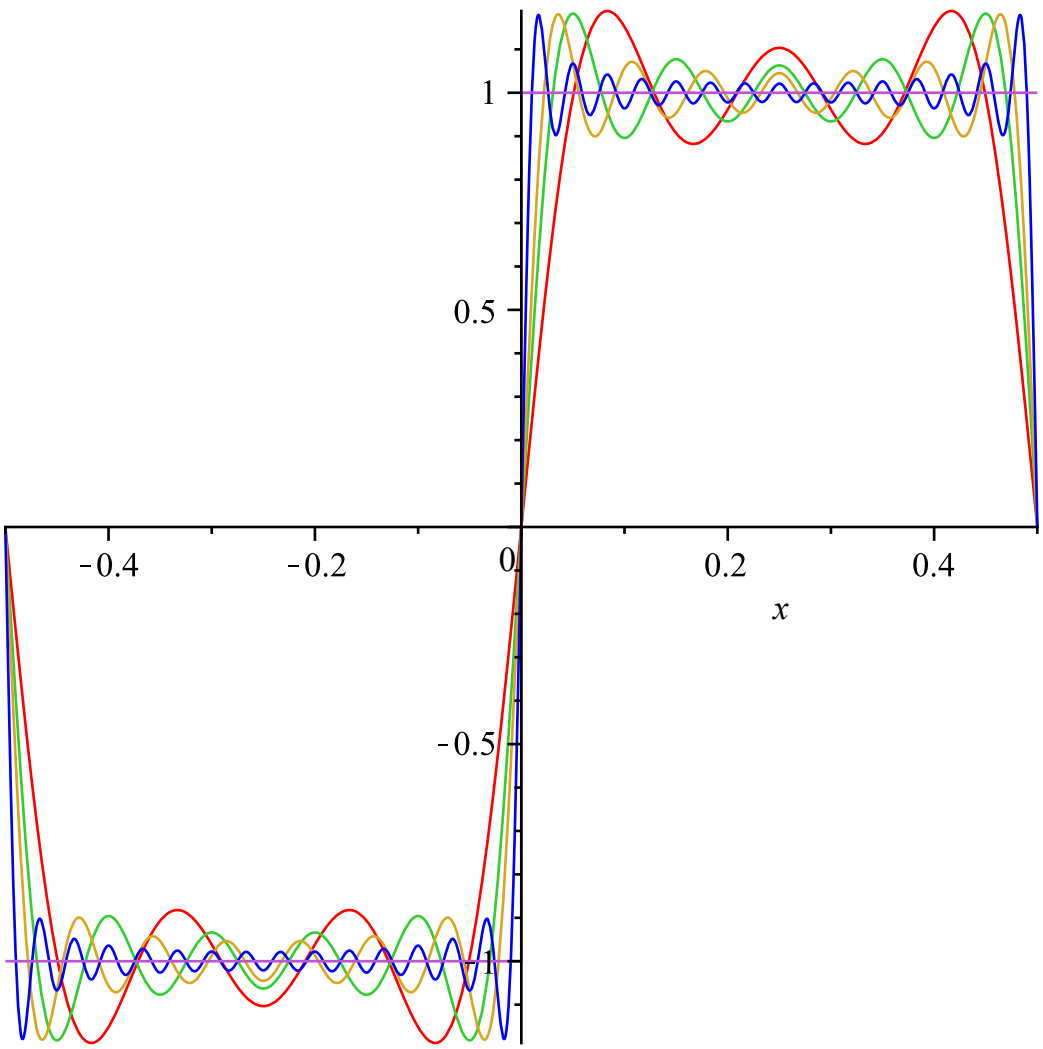
```
> s13 := std_sum(13);
```

$$s13 := \frac{4\sin(2\pi x)}{\pi} + \frac{4}{3}\frac{\sin(6\pi x)}{\pi} + \frac{4}{5}\frac{\sin(10\pi x)}{\pi} + \frac{4}{7}\frac{\sin(14\pi x)}{\pi} + \frac{4}{9}\frac{\sin(18\pi x)}{\pi} + \frac{4}{11}\frac{\sin(22\pi x)}{\pi} + \frac{4}{13}\frac{\sin(26\pi x)}{\pi} \quad (5)$$

```
> s29 := std_sum(29);
```

$$s29 := \frac{4\sin(2\pi x)}{\pi} + \frac{4}{3}\frac{\sin(6\pi x)}{\pi} + \frac{4}{5}\frac{\sin(10\pi x)}{\pi} + \frac{4}{7}\frac{\sin(14\pi x)}{\pi} + \frac{4}{9}\frac{\sin(18\pi x)}{\pi} + \frac{4}{11}\frac{\sin(22\pi x)}{\pi} + \frac{4}{13}\frac{\sin(26\pi x)}{\pi} + \frac{4}{15}\frac{\sin(30\pi x)}{\pi} + \frac{4}{17}\frac{\sin(34\pi x)}{\pi} + \frac{4}{19}\frac{\sin(38\pi x)}{\pi} + \frac{4}{21}\frac{\sin(42\pi x)}{\pi} + \frac{4}{23}\frac{\sin(46\pi x)}{\pi} + \frac{4}{25}\frac{\sin(50\pi x)}{\pi} + \frac{4}{27}\frac{\sin(54\pi x)}{\pi} + \frac{4}{29}\frac{\sin(58\pi x)}{\pi} \quad (6)$$

```
> plot({f,s5,s9,s13,s29},x=-0.5..0.5);
```




```
> cesaro_sum := proc(N)
  local out, k;
  out := 0;
  for k from 1 to N-1 do
  out := out + ((N-k)/N)*b(k)*sin(2*Pi*k*x)
  end do;
  out
  end proc:
```

```
> sigma6 := cesaro_sum(6);
```

$$\sigma 6 := \frac{10}{3}\,\frac{\sin(2\pi x)}{\pi} + \frac{2}{3}\,\frac{\sin(6\pi x)}{\pi} + \frac{2}{15}\,\frac{\sin(10\pi x)}{\pi} \tag{7}$$

```
> sigma10 := cesaro_sum(10);
```

$$\sigma 10 := \frac{18}{5}\,\frac{\sin(2\pi x)}{\pi} + \frac{14}{15}\,\frac{\sin(6\pi x)}{\pi} + \frac{2}{5}\,\frac{\sin(10\pi x)}{\pi} + \frac{6}{35}\,\frac{\sin(14\pi x)}{\pi} + \frac{2}{45}\,\frac{\sin(18\pi x)}{\pi} \tag{8}$$

```
> sigma14 := cesaro_sum(14);
```

(9)

$$\sigma 14 := \frac{26}{7}\,\frac{\sin(2\pi x)}{\pi} + \frac{22}{21}\,\frac{\sin(6\pi x)}{\pi} + \frac{18}{35}\,\frac{\sin(10\pi x)}{\pi} + \frac{2}{7}\,\frac{\sin(14\pi x)}{\pi} + \frac{10}{63}\,\frac{\sin(18\pi x)}{\pi} + \frac{6}{77}\,\frac{\sin(22\pi x)}{\pi} + \frac{2}{91}\,\frac{\sin(26\pi x)}{\pi} \tag{9}$$

```
> sigma30 := cesaro_sum(30);
```

$$\sigma 30 := \frac{58}{15}\,\frac{\sin(2\pi x)}{\pi} + \frac{6}{5}\,\frac{\sin(6\pi x)}{\pi} + \frac{2}{3}\,\frac{\sin(10\pi x)}{\pi} + \frac{46}{105}\,\frac{\sin(14\pi x)}{\pi} + \frac{14}{45}\,\frac{\sin(18\pi x)}{\pi} + \frac{38}{165}\,\frac{\sin(22\pi x)}{\pi} + \frac{34}{195}\,\frac{\sin(26\pi x)}{\pi} + \frac{2}{15}\,\frac{\sin(30\pi x)}{\pi} + \frac{26}{255}\,\frac{\sin(34\pi x)}{\pi} + \frac{22}{285}\,\frac{\sin(38\pi x)}{\pi} + \frac{2}{35}\,\frac{\sin(42\pi x)}{\pi} + \frac{14}{345}\,\frac{\sin(46\pi x)}{\pi} + \frac{2}{75}\,\frac{\sin(50\pi x)}{\pi} + \frac{2}{135}\,\frac{\sin(54\pi x)}{\pi} + \frac{2}{435}\,\frac{\sin(58\pi x)}{\pi} \tag{10}$$

```
> plot({f,sigma6,sigma10,sigma14,sigma30},x=-0.5..0.5);
```