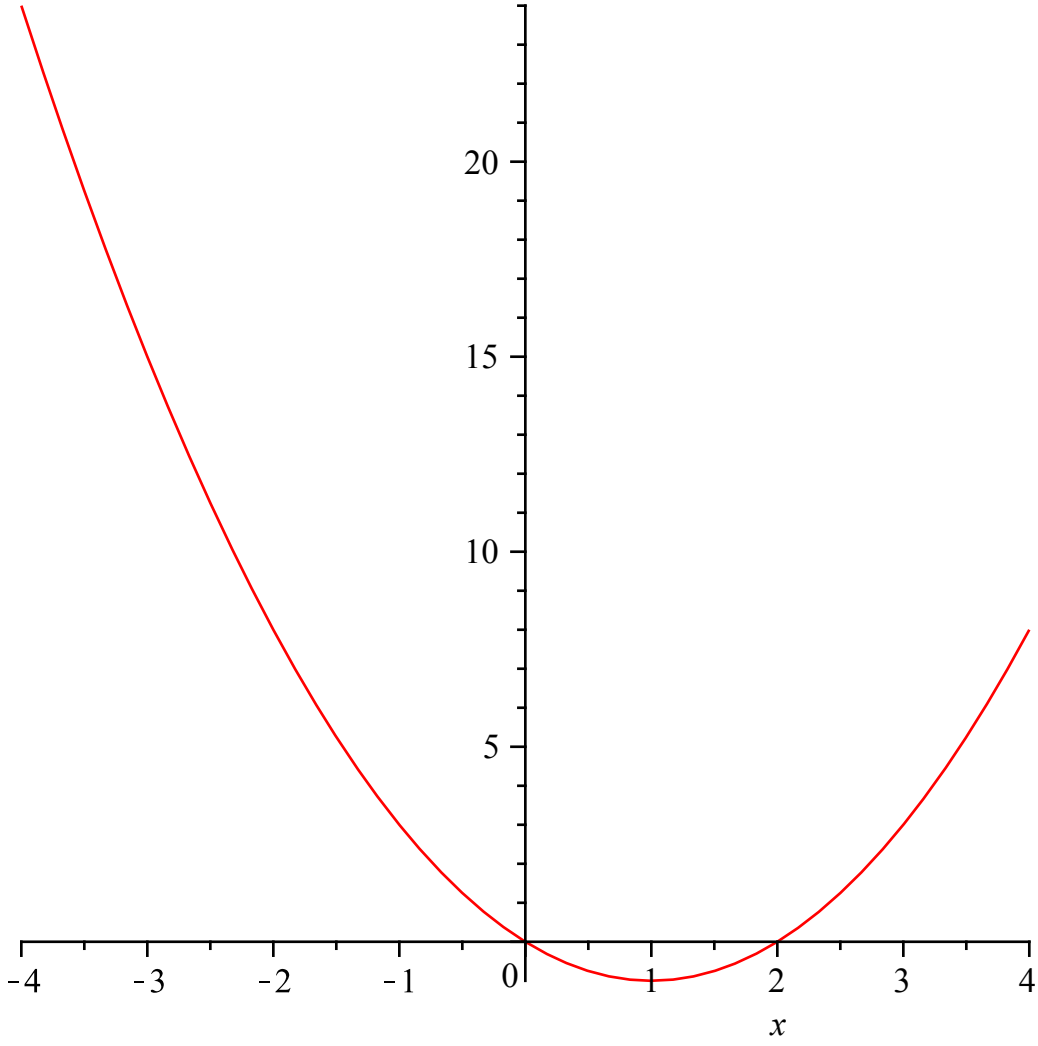
```
> restart :
> F(x) := x··2 − 2·x;
```

$$F(x) := x^2 - 2\,x \tag{1}$$

```
> plot(F(x), x = -4 ..4);
```




```
> L := 4;
```

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

```
> a0 := (1/L)·int(F(x), x = -L..L);
```

$$a_0 := \frac{32}{3} \tag{3}$$

```
> C := a0/2;
```

$$C := \frac{16}{3} \tag{4}$$

```
> an := (1/L)·int(F(x)·cos(n·Pi·x/L), x = -L..L);
```

**(5)**

$$a_n := \frac{32\left(-2\sin(n\pi) + n^2\pi^2\sin(n\pi) + 2n\pi\cos(n\pi)\right)}{n^3\pi^3} \tag{5}$$

> $b_n := \left(\frac{1}{L}\right)\cdot int\left(F(x)\cdot\sin\left(\frac{n\cdot\mathrm{Pi}\cdot x}{L}\right), x = -L..L\right);$

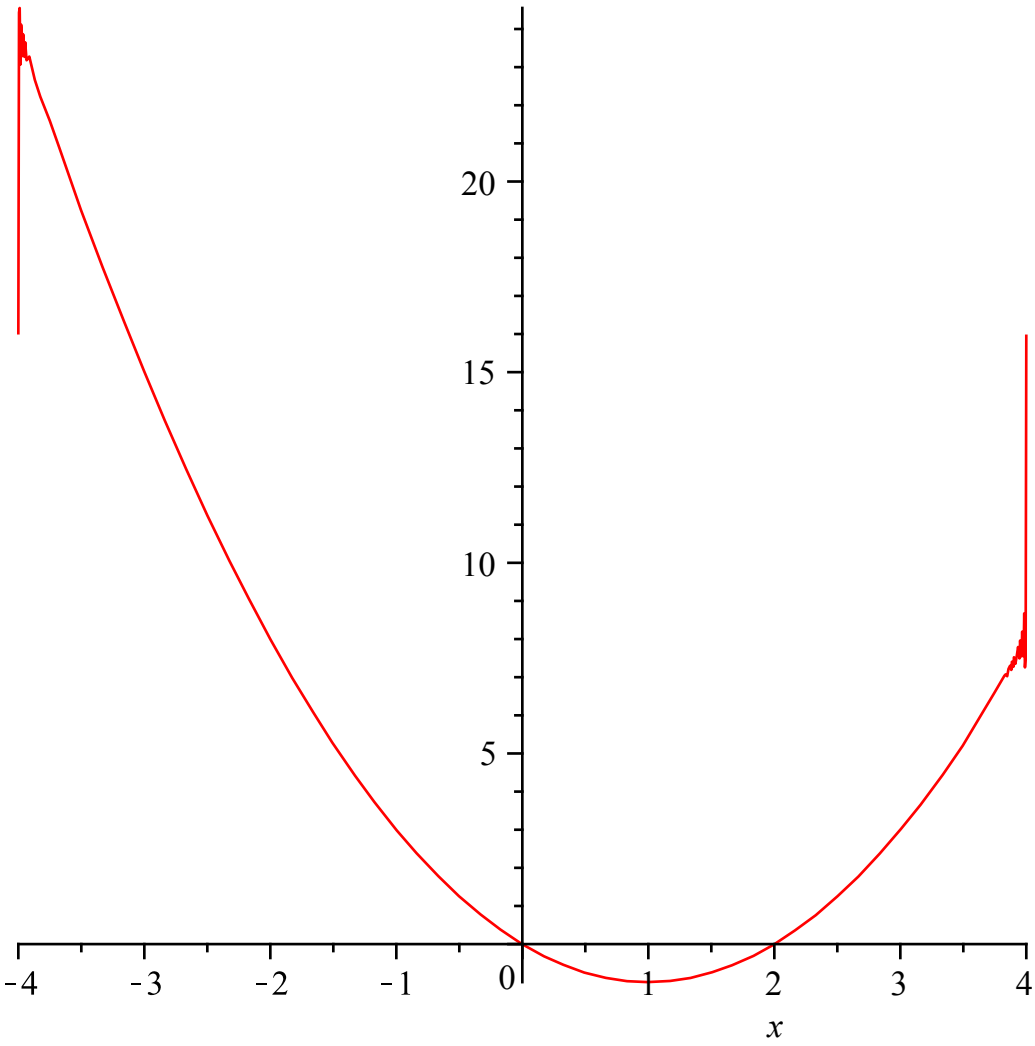
$$b_n := \frac{16\left(n\pi\cos(n\pi) - \sin(n\pi)\right)}{n^2\pi^2} \tag{6}$$

> $STF := C + Sum\left(a_n\cdot\cos\left(\frac{n\cdot\mathrm{Pi}\cdot x}{L}\right) + b_n\cdot\sin\left(\frac{n\cdot\mathrm{Pi}\cdot x}{L}\right), n = 1..infinity\right);$

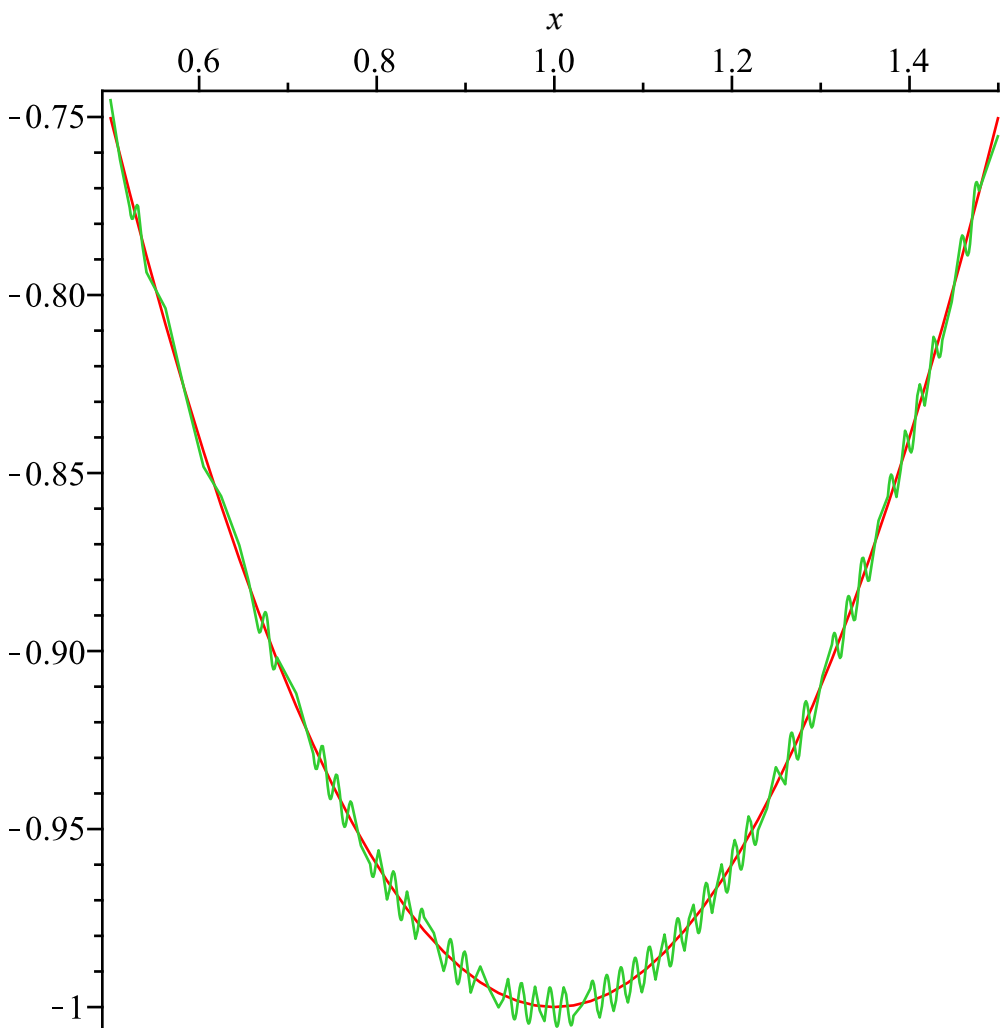
$$STF := \frac{16}{3} + \sum_{n=1}^{\infty}\left(\frac{32\left(-2\sin(n\pi) + n^2\pi^2\sin(n\pi) + 2n\pi\cos(n\pi)\right)\cos\left(\frac{1}{4}n\pi x\right)}{n^3\pi^3} + \frac{16\left(n\pi\cos(n\pi) - \sin(n\pi)\right)\sin\left(\frac{1}{4}n\pi x\right)}{n^2\pi^2}\right) \tag{7}$$

> $STF_{500} := C + sum\left(a_n\cdot\cos\left(\frac{n\cdot\mathrm{Pi}\cdot x}{L}\right) + b_n\cdot\sin\left(\frac{n\cdot\mathrm{Pi}\cdot x}{L}\right), n = 1..500\right):$

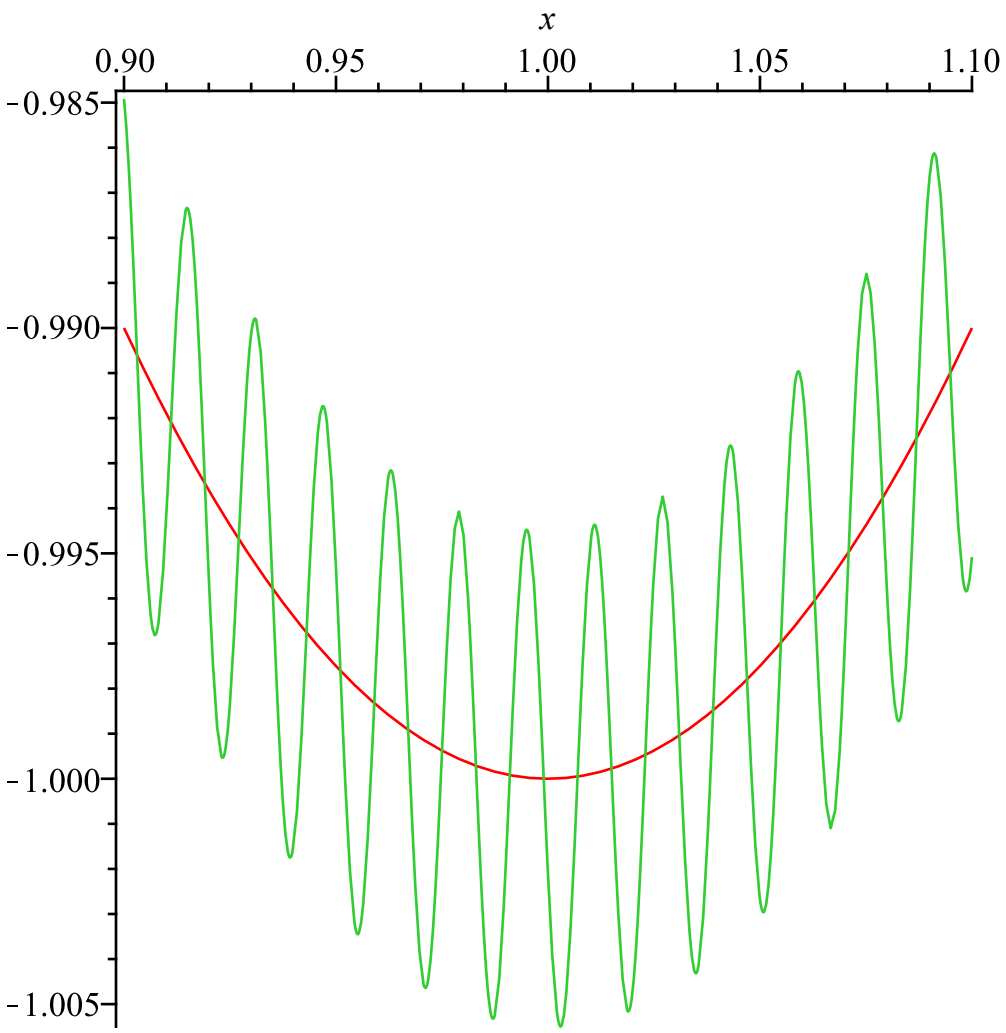
> $plot\left(STF_{500}, x = -L..L\right);$




> $plot([F(x), STF_{500}], x = 0.5 \ldots 1.5)$

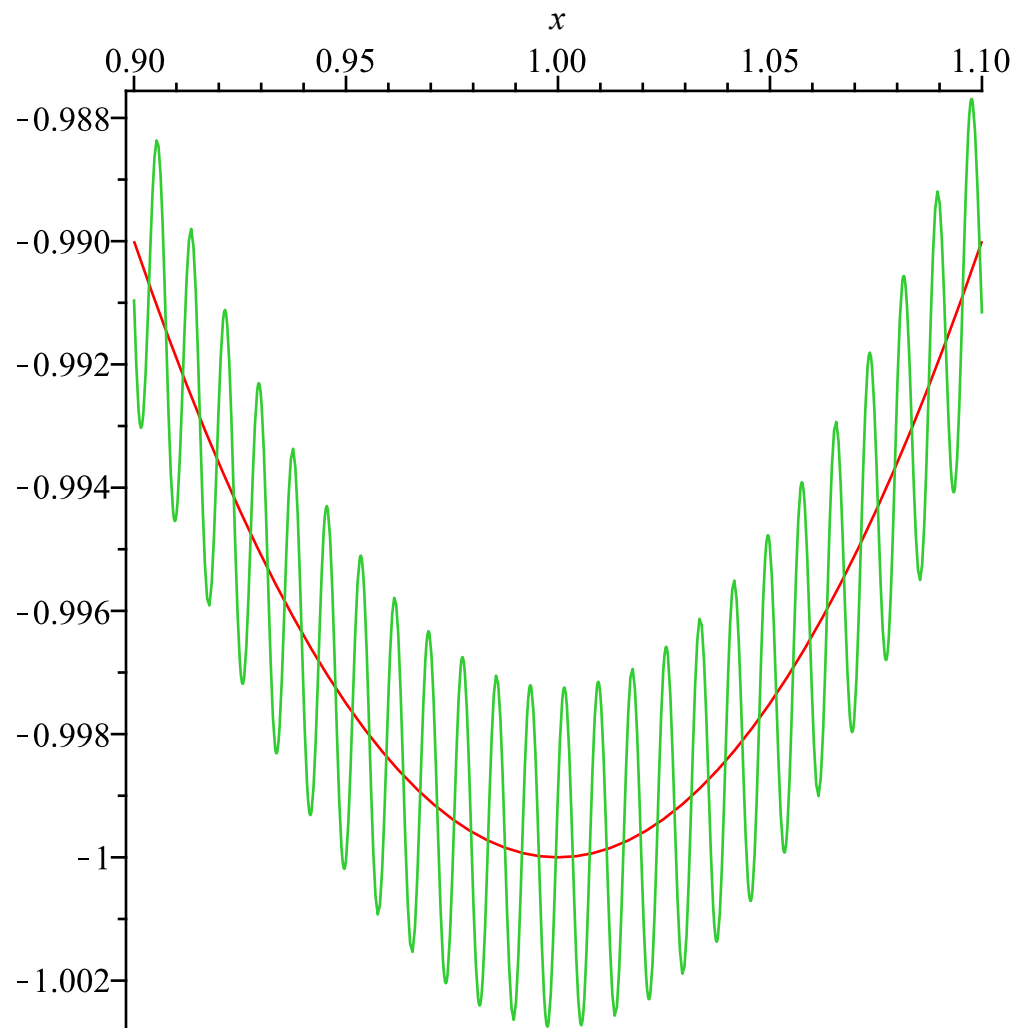



> $plot([F(x), STF_{500}], x = 0.9..1.1)$

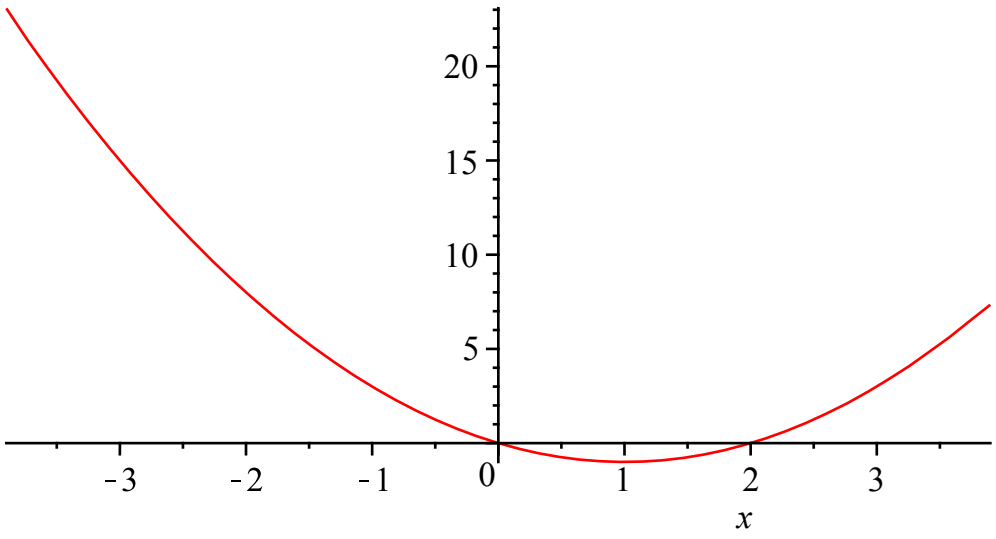



> $STF_{1000} := C + sum\left(a_n \cdot \cos\left(\frac{n \cdot \mathrm{Pi} \cdot x}{L}\right) + b_n \cdot \sin\left(\frac{n \cdot \mathrm{Pi} \cdot x}{L}\right), n = 1..1000\right)$ :

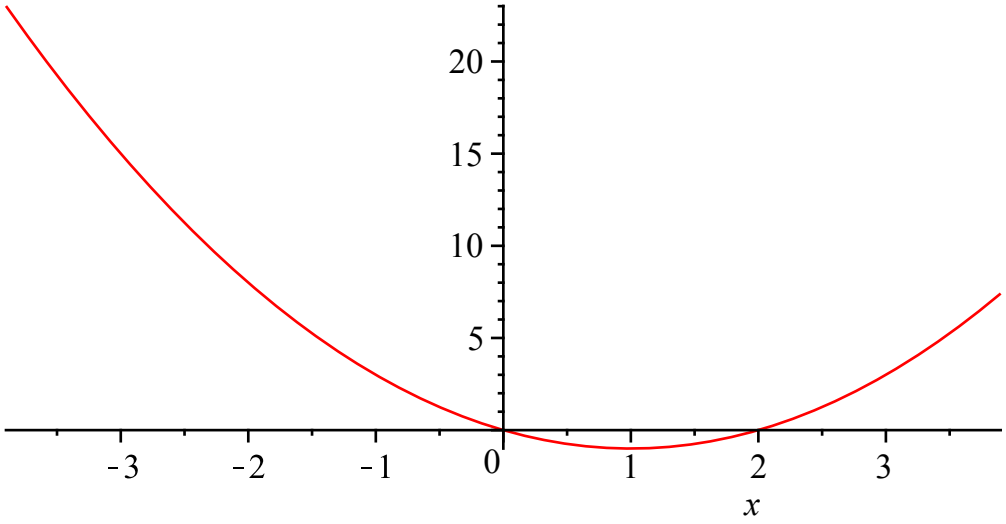
> $plot\left([F(x), STF_{1000}], x = 0.9..1.1\right)$



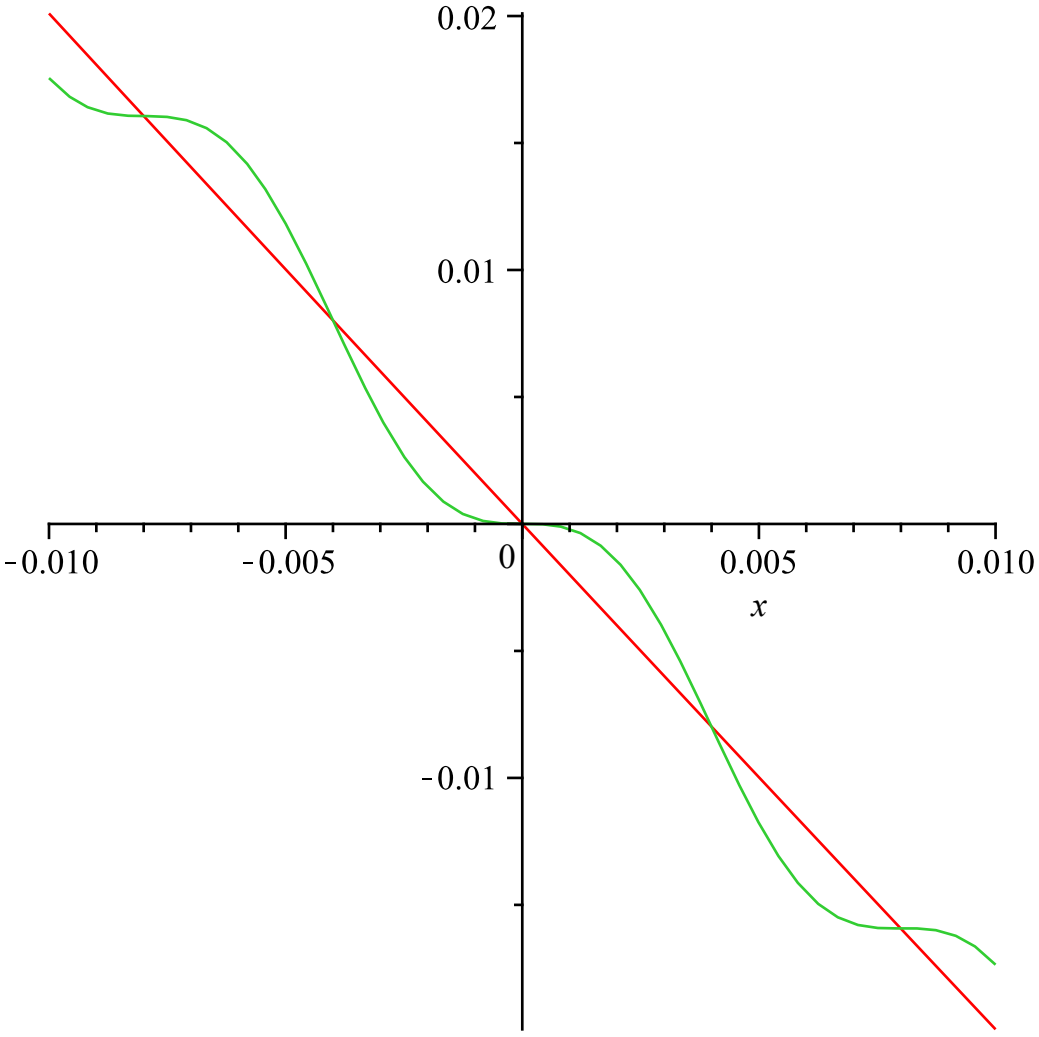

> $plot(STF_{1000}, x=-3.9..3.9)$




> $plot(F(x), x=-3.9..3.9)$




> $plot([F(x), STF_{1000}], x = -0.01..0.01)$

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