

> restart

> Ecuacion := diff(f(x, y), x\$2) + diff(f(x, y), x, y) = diff(f(x, y), y\$3);

$$Ecuacion := \frac{\partial^2}{\partial x^2} f(x, y) + \frac{\partial^2}{\partial y \partial x} f(x, y) = \frac{\partial^3}{\partial y^3} f(x, y) \quad (1)$$

> Solucion := pdsolve(Ecuacion)

$$Solucion := f(x, y) = \_C3 + \_C4 (\_C3 + \_C1 x + \_C2 y) + \frac{C1 (\_C3 + \_C1 x + \_C2 y) (\_C2 + \_C1)}{\_C2^3} + \_C5 e \quad (2)$$

> Ecuacion2 := lhs(Ecuacion) = diff(f(x, y), y);

$$Ecuacion2 := \frac{\partial^2}{\partial x^2} f(x, y) + \frac{\partial^2}{\partial y \partial x} f(x, y) = \frac{\partial}{\partial y} f(x, y) \quad (3)$$

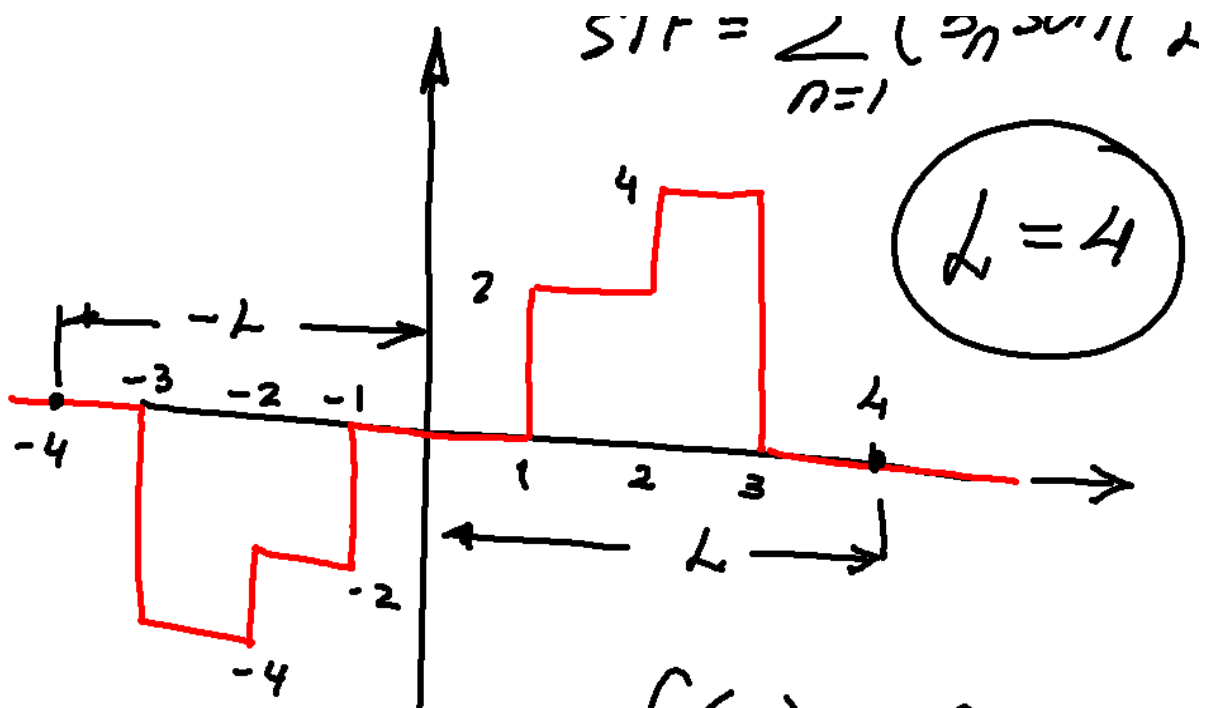
> with(PDEtools) :

> Solucion2 := build(pdsolve(Ecuacion2));

$$Solucion2 := f(x, y) = \_C2 \_C1 e^{\frac{-c_1 y}{1 + \_c1}} e^{\frac{-c_1^2 y}{1 + \_c1}} e^{\frac{-c_1 (x - y)}{1 + \_c1}} \quad (4)$$

> restart

>



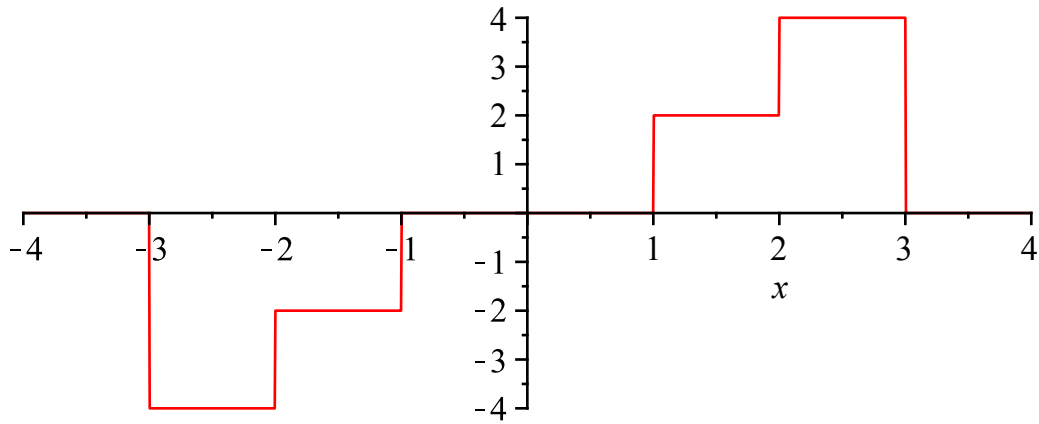
> L := 4;

L := 4

(5)

> f(x) := -4·Heaviside(x + 3) + 2·Heaviside(x + 2) + 2·Heaviside(x + 1) + 2·Heaviside(x - 1) + 2·Heaviside(x - 2) - 4·Heaviside(x - 3); plot(f(x), x = -L..L);

f(x) := -4 Heaviside(x + 3) + 2 Heaviside(x + 2) + 2 Heaviside(x + 1) + 2 Heaviside(x - 1) + 2 Heaviside(x - 2) - 4 Heaviside(x - 3)



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

$$b_n := - \frac{8 \cos \left( \frac{3}{4} n \pi \right)}{n \pi} + \frac{4 \cos \left( \frac{1}{2} n \pi \right)}{n \pi} + \frac{4 \cos \left( \frac{1}{4} n \pi \right)}{n \pi}$$

(6)

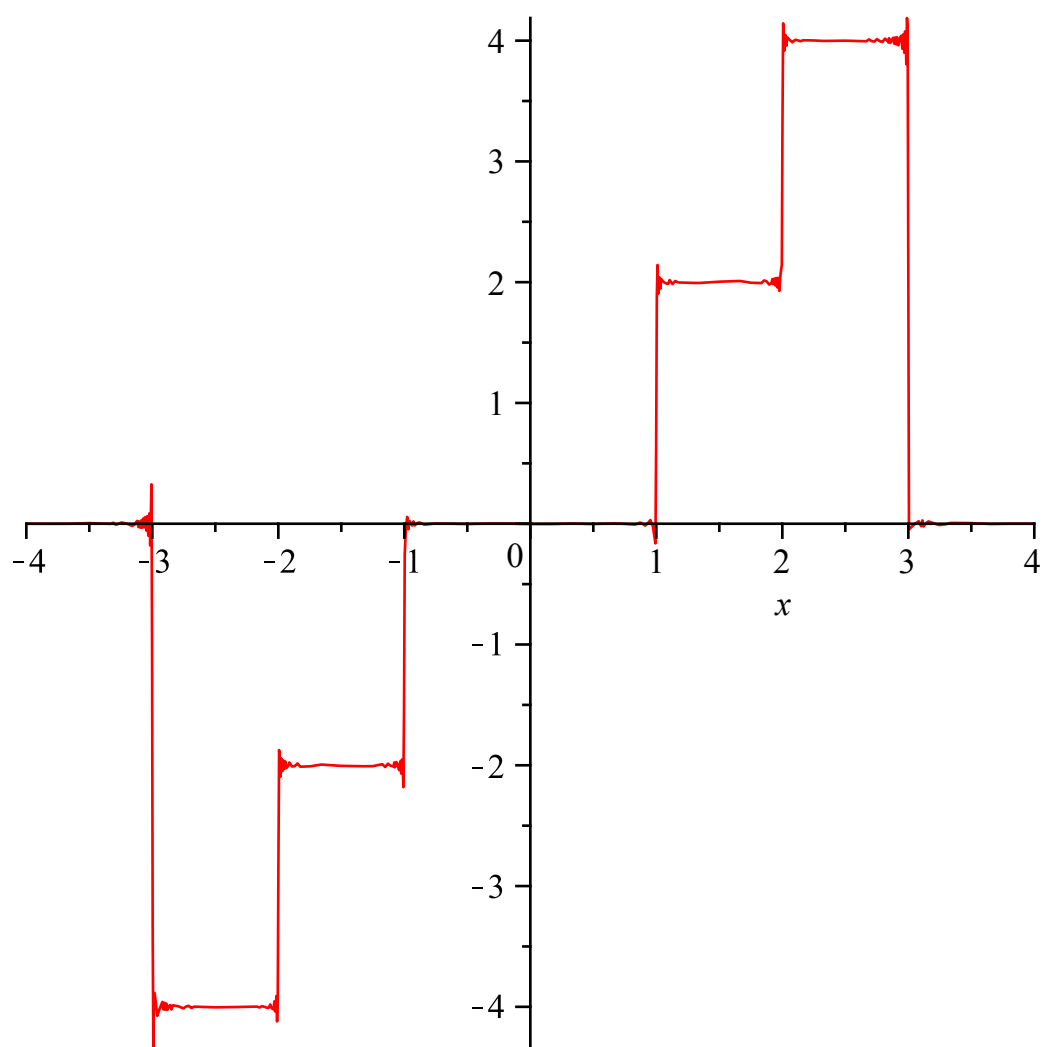
>  $STF := \text{Sum} \left( b_n \cdot \sin \left( \frac{n \cdot \text{Pi} \cdot x}{L} \right), n = 1 .. \text{infinity} \right)$

$$STF := \sum_{n=1}^{\infty} \left( - \frac{8 \cos \left( \frac{3}{4} n \pi \right)}{n \pi} + \frac{4 \cos \left( \frac{1}{2} n \pi \right)}{n \pi} + \frac{4 \cos \left( \frac{1}{4} n \pi \right)}{n \pi} \right) \sin \left( \frac{1}{4} n \pi x \right)$$

(7)

>  $STF_{500} := \text{sum} \left( b_n \cdot \sin \left( \frac{n \cdot \text{Pi} \cdot x}{L} \right), n = 1 .. 500 \right);$

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



=  
> `plot([f(x), STF500], x = 0.9 .. 1.1)`

