

```
> restart
```

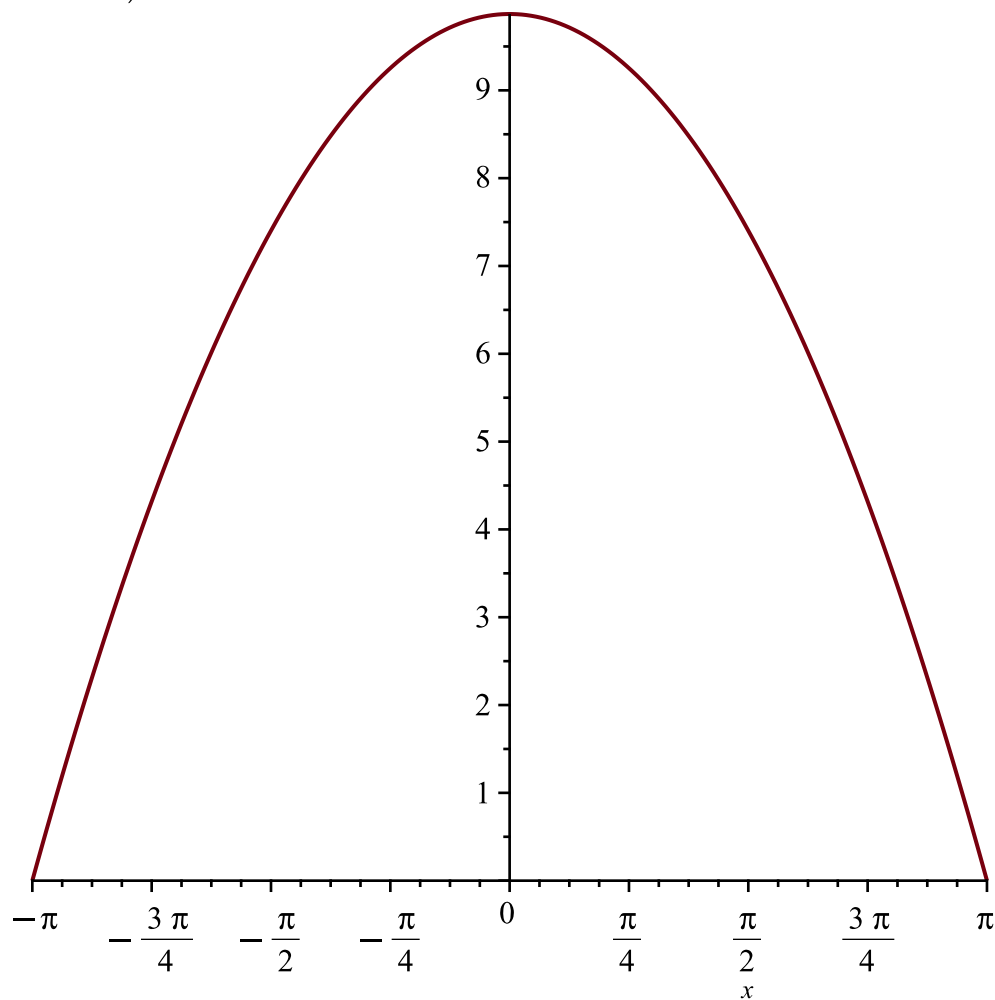
```
> f :=  $\pi^2 - x^2$ 
```

$$f := \pi^2 - x^2 \quad (1)$$

```
> Intervalo := -Pi..Pi
```

$$Intervalo := -\pi..pi \quad (2)$$

```
> plot(f, x = -Pi..Pi)
```



```
> L := Pi
```

$$L := \pi \quad (3)$$

```
> a[0] :=  $\frac{1}{L} \cdot \text{int}(f, x = -L..L)$ 
```

$$a_0 := \frac{4\pi^2}{3} \quad (4)$$

```
> a[n] := subs( sin(n·Pi) = 0, cos(n·Pi) = (-1)^n,  $\frac{1}{L} \cdot \text{int}\left(f \cdot \cos\left(\frac{n \cdot \text{Pi}}{L} \cdot x\right), x = -L..L\right)$  )
```

$$a_n := -\frac{4(-1)^n}{n^2} \quad (5)$$

$$\begin{aligned} &> b[n] := \text{subs}\left(\sin(n \cdot \text{Pi}) = 0, \cos(n \cdot \text{Pi}) = (-1)^n, \frac{1}{L} \cdot \text{int}\left(f \cdot \sin\left(\frac{n \cdot \text{Pi}}{L} \cdot x\right), x = -L..L\right)\right) \\ &\quad b_n := 0 \end{aligned} \quad (6)$$

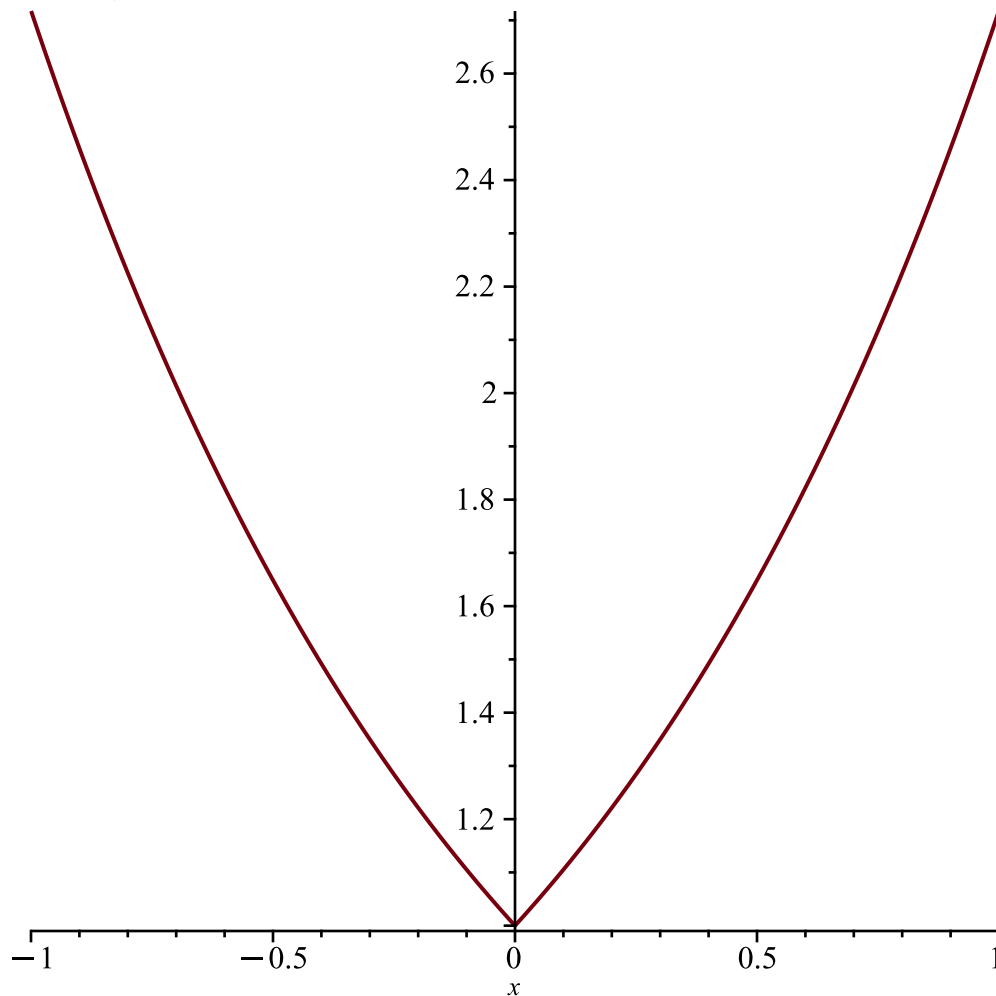
restart

$$\begin{aligned} &> f := \text{Heaviside}(x + a) \cdot \exp(-a \cdot x) - \text{Heaviside}(x) \cdot \exp(-a \cdot x) + \text{Heaviside}(x) \cdot \exp(a \cdot x) \\ &\quad - \text{Heaviside}(x - a) \cdot \exp(a \cdot x) \\ &\quad f := \text{Heaviside}(x + a) e^{-a x} - \text{Heaviside}(x) e^{-a x} + \text{Heaviside}(x) e^{a x} - \text{Heaviside}(x - a) e^{a x} \end{aligned} \quad (7)$$

$$\begin{aligned} &> \text{Intervalo} := -a..0 \\ &\quad \text{Intervalo} := -a..0 \end{aligned} \quad (8)$$

$$\begin{aligned} &> h := \text{subs}(a = 1, f) \\ &\quad h := \text{Heaviside}(x + 1) e^{-x} - \text{Heaviside}(x) e^{-x} + \text{Heaviside}(x) e^x - \text{Heaviside}(x - 1) e^x \end{aligned} \quad (9)$$

$\text{plot}(h, x = -1..1)$



$$\begin{aligned} &> L := 1 \\ &\quad L := 1 \end{aligned} \quad (10)$$

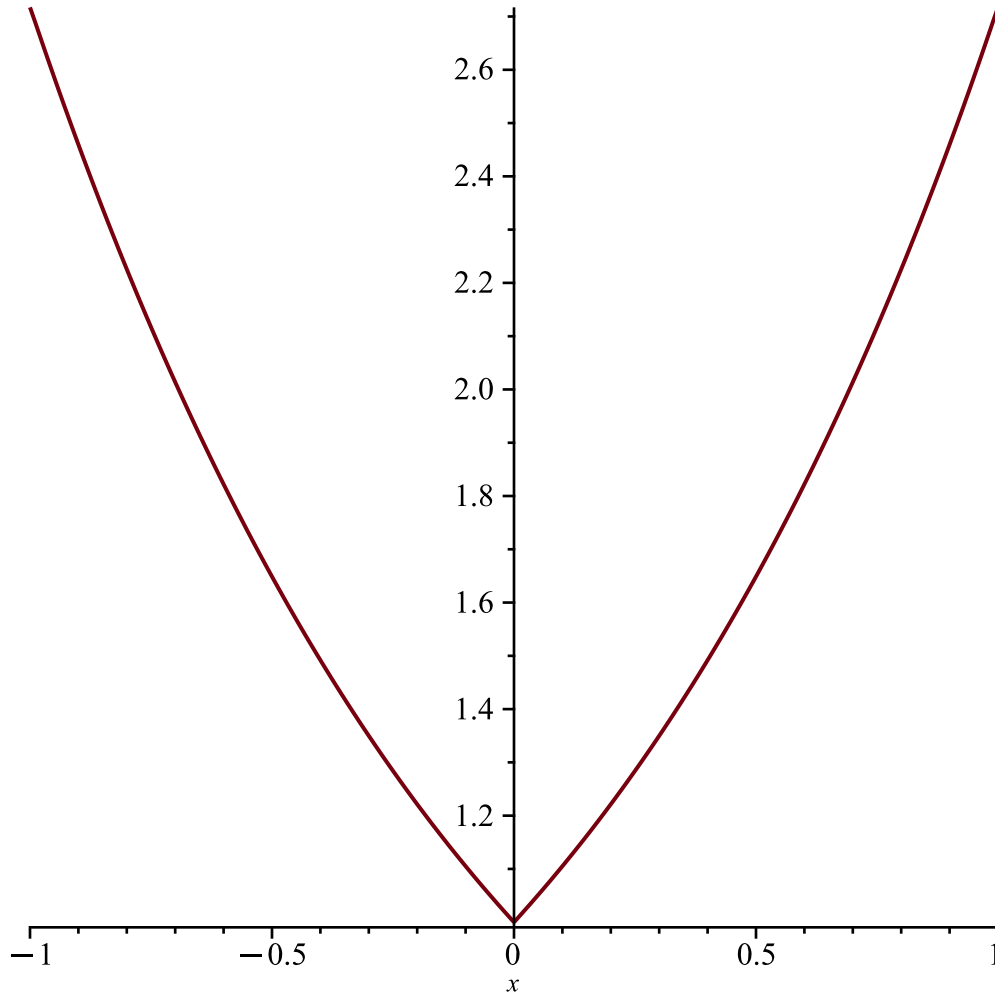
$$\begin{aligned} &> a[0] := \frac{1}{L} \cdot \text{int}(h, x = -L..L) \\ &\quad a_0 := 2e - 2 \end{aligned} \quad (11)$$

$$\begin{aligned}
 & \text{> } a[n] := \frac{1}{L} \cdot \text{int} \left(h \cdot \cos \left(\frac{n \cdot \text{Pi}}{L} \cdot x \right), x = -L..L \right) \\
 a_n &:= \frac{-2 + 2 n \pi e \sin(n \pi) + 2 e \cos(n \pi)}{n^2 \pi^2 + 1} + \frac{-1 + n \pi e \sin(n \pi) + e \cos(n \pi)}{n^2 \pi^2 + 1} \\
 &+ \frac{-n \pi e \sin(n \pi) - e \cos(n \pi) + 1}{n^2 \pi^2 + 1}
 \end{aligned} \tag{12}$$

$$\begin{aligned}
 & \text{> } aa[0] := \text{subs}(a = 1, a[0]) \\
 & \qquad \qquad \qquad aa_0 := 2 e - 2
 \end{aligned} \tag{13}$$

$$\begin{aligned}
 & \text{> } aa[n] := \text{subs}(a = 1, a[n]) \\
 aa_n &:= \frac{-2 + 2 n \pi e \sin(n \pi) + 2 e \cos(n \pi)}{n^2 \pi^2 + 1} + \frac{-1 + n \pi e \sin(n \pi) + e \cos(n \pi)}{n^2 \pi^2 + 1} \\
 &+ \frac{-n \pi e \sin(n \pi) - e \cos(n \pi) + 1}{n^2 \pi^2 + 1}
 \end{aligned} \tag{14}$$

$$\begin{aligned}
 & \text{> } STF500 := \frac{aa[0]}{2} + \text{sum} \left(aa[n] \cdot \cos \left(\frac{n \cdot \text{Pi}}{L} \cdot x \right), n = 1..500 \right) : \\
 & \text{> } \text{plot}(STF500, x = -L..L)
 \end{aligned}$$



```

|> restart
|=
|> Ecua := (3·x2 + 6·x·y(x)2) + (6·x2·y(x) + 4·y(x)3)·diff(y(x), x) = 0
|      Ecua := 3 x2 + 6 x y(x)2 + (6 x2 y(x) + 4 y(x)3) ( d/dx y(x) ) = 0 (15)
|=
|> with(DEtools) :
|=
|> odeadvisor(Ecua)
|      [_exact, _rational] (16)
|=
|>
|=
|>
|=
|>

```