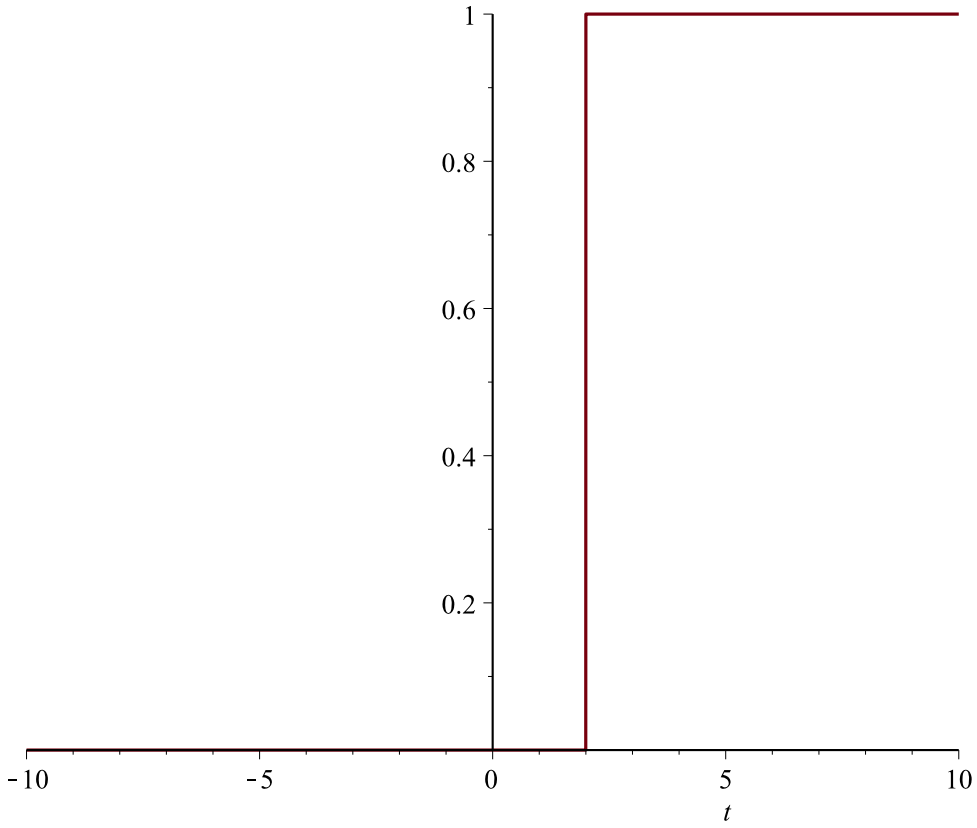
```
> restart
> f := Heaviside(t - 2)
```

$$f := \text{Heaviside}(t-2) \tag{1}$$

```
> plot(f, t = -10..10)
```




```
> with(inttrans)
```

[*addtable, fourier, fouriercos, fouriersin, hankel, hilbert, invfourier, invhilbert, invlaplace, invmellin, laplace, mellin, savetable*] **(2)**

```
> F := laplace(f, t, s)
```

$$F := \frac{e^{-2s}}{s} \tag{3}$$

```
> g := Dirac(t - 2)
```

$$g := \text{Dirac}(t-2) \tag{4}$$

```
> G := laplace(g, t, s)
```

$$G := e^{-2s} \tag{5}$$

```
> restart
```

Circuito eléctrico

```
> Ecua := L·diff(i(t), t) + R·i(t) = Heaviside(t - 2)·120 cos(t - 2)
```

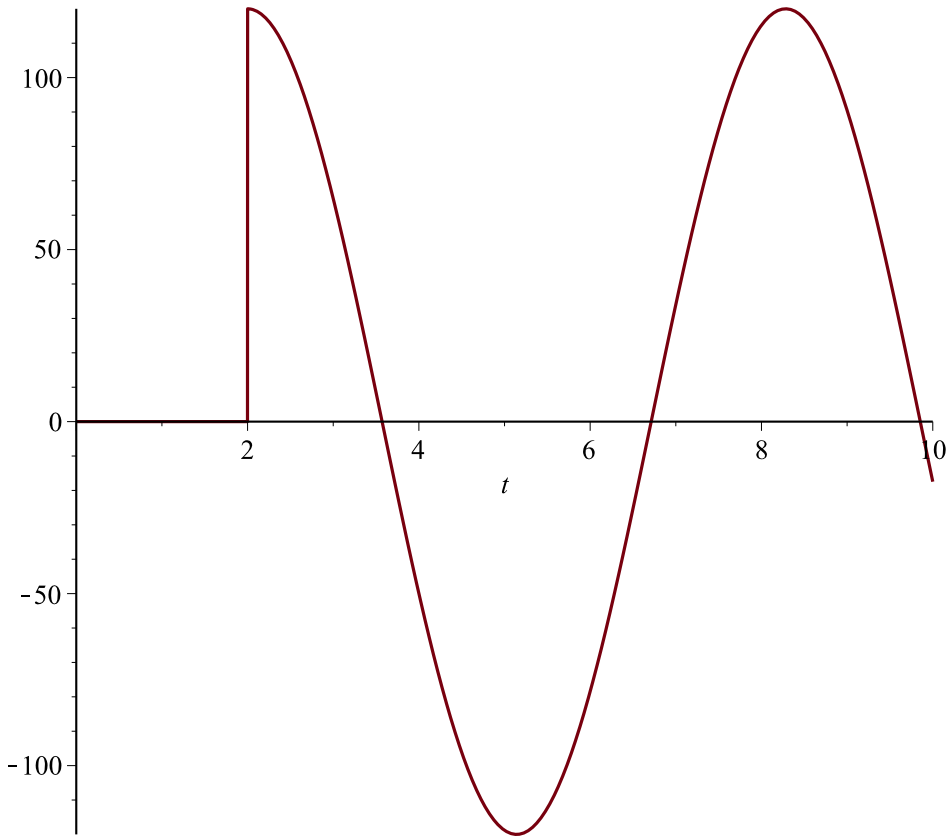
(6)

$$Ecua := L\left(\frac{d}{dt}\,i(t)\right) + R\,i(t) = 120\ \text{Heaviside}(t-2)\,\cos(t-2) \tag{6}$$

> $Q := rhs(Ecua)$

$$Q := 120\ \text{Heaviside}(t-2)\,\cos(t-2) \tag{7}$$

> $plot(Q, t = 0..10)$



> $L := \frac{1}{100}; R := 10$

$$L := \frac{1}{100}$$
$$R := 10 \tag{8}$$

> $Cond := i(0) = 0$

$$Cond := i(0) = 0 \tag{9}$$

> $with(inttrans)$:

> $EcuaTL := subs(Cond, laplace(Ecua, t, s))$

$$EcuaTL := \frac{1}{100}\,s\,laplace(i(t), t, s) + 10\,laplace(i(t), t, s) = \frac{120\,e^{-2s}\,s}{s^2+1} \tag{10}$$

> $SolParTL := isolate(EcuaTL, laplace(i(t), t, s))$

$$SolParTL := laplace(i(t), t, s) = \frac{120\, e^{-2s} s}{(s^2+1)\left(\frac{1}{100}s + 10\right)} \quad (11)$$

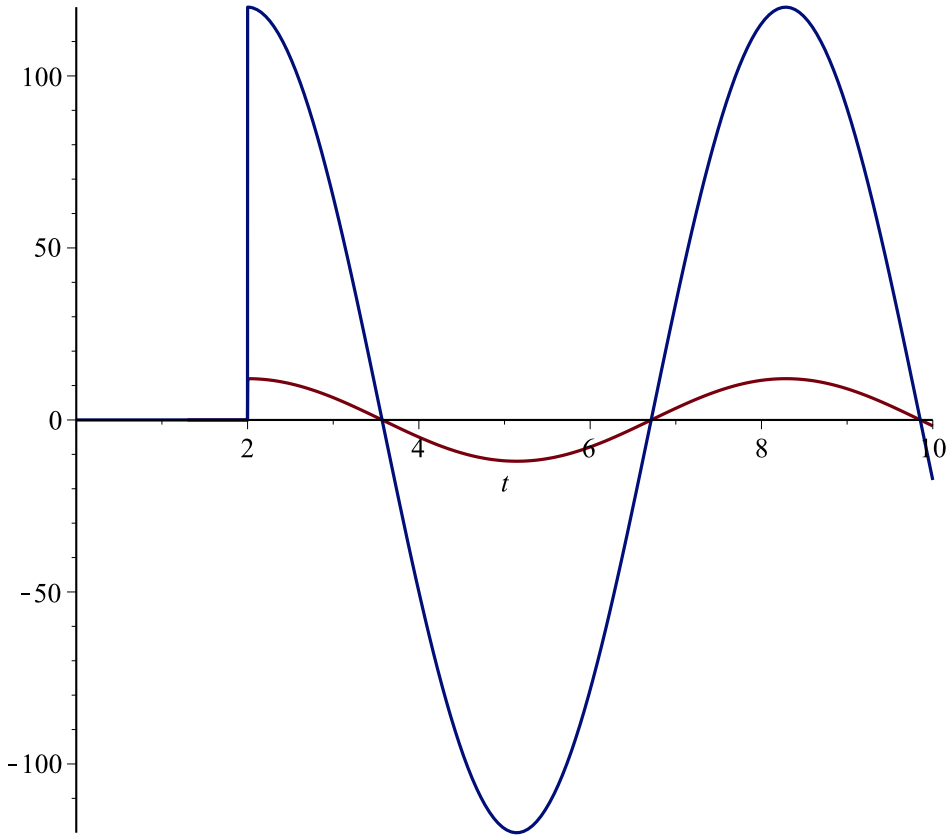
> $SolPart := invlaplace(SolParTL, s, t)$

$$SolPart := i(t) = \frac{12000}{1000001}\, \text{Heaviside}(t-2)\left(1000\cos(t-2) - 1000\, e^{-1000t+2000} + \sin(t-2)\right) \quad (12)$$

> $evalf(\%, 3)$

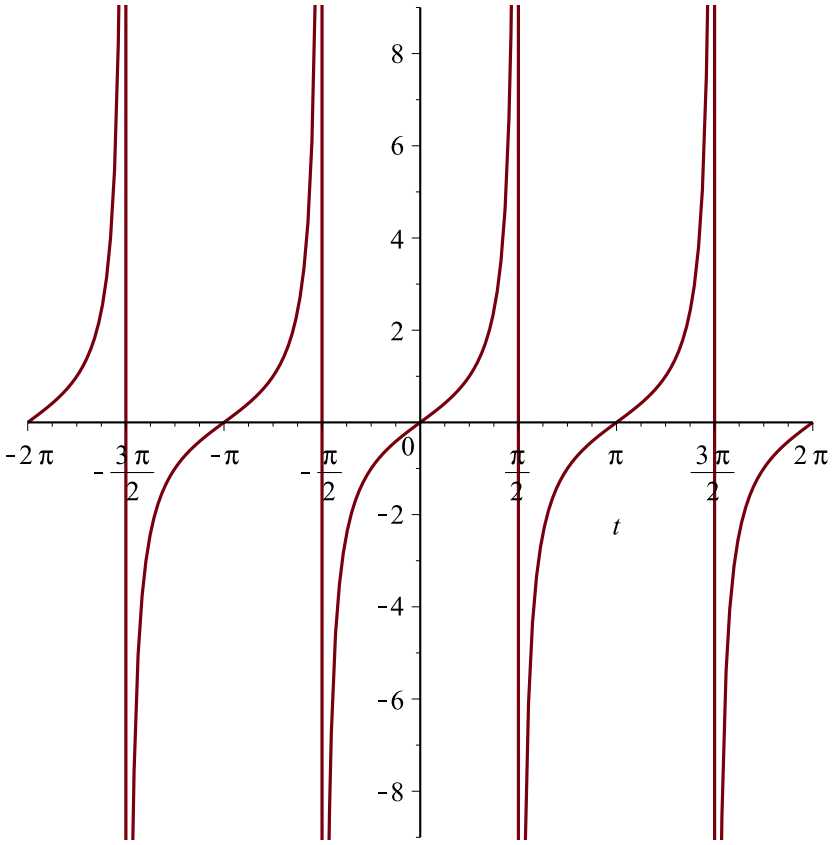
$$i(t) = 0.0120\, \text{Heaviside}(t-2.)\left(1000.\cos(t-2.) - 1000.\, e^{-1000.t+2000.} + \sin(t-2.)\right) \quad (13)$$

> $plot([rhs(SolPart), Q], t = 0..10)$



> $restart$

> $plot(\tan(t), t = -2\cdot Pi..2\ Pi)$



> *restart*

>

> $Integral := \frac{1}{3} \cdot Int(\cos(3 \cdot tau) \cdot \sin(3(t - tau)), tau = 0..t) = \frac{1}{3} \cdot int(\cos(3 \cdot tau) \cdot \sin(3(t - tau)), tau = 0..t)$

$$Integral := \frac{1}{3} \int_0^t \cos(3\,\tau)\,\sin(3\,t - 3\,\tau)\,d\tau = \frac{1}{6}\,\sin(3\,t)\,t \tag{14}$$

> $F := \frac{s}{(s^2+9)^2}$

$$F := \frac{s}{(s^2+9)^2} \tag{15}$$

> *with*(*inttrans*) :

> $f := invlaplace(F, s, t)$

$$f := \frac{1}{6}\,\sin(3\,t)\,t \tag{16}$$

>

>