```
> restart
> with(inttrans)
```

[addtable, fourier, fouriercos, fouriersin, hankel, hilbert, invfourier, invhilbert, invlaplace, invmellin, laplace, mellin, savetable] **(1)**

```
> FUNCION := f(t) = exp(3·t) + 5·sin(4·t) + t··2
```

$$FUNCION := f(t) = e^{3t} + 5\sin(4t) + t^2 \quad \textbf{(2)}$$

```
> laplace(FUNCION, t, s)
```

$$laplace(f(t), t, s) = \frac{1}{s-3} + \frac{20}{s^2+16} + \frac{2}{s^3} \quad \textbf{(3)}$$

```
> FP := laplace(y(t), t, s) = (s··4 + 5·s··2 − 6)/((s − 2)·(s··2 + s + 1))
```

$$FP := laplace(y(t), t, s) = \frac{s^4 + 5s^2 - 6}{(s-2)(s^2+s+1)} \quad \textbf{(4)}$$

```
> invlaplace(FP, s, t)
```

$$y(t) = \text{Dirac}(1,t) + \text{Dirac}(t) + \frac{30}{7}e^{2t} + \frac{1}{7}e^{-\frac{1}{2}t}\left(19\cos\left(\frac{1}{2}\sqrt{3}\,t\right) + 13\sqrt{3}\sin\left(\frac{1}{2}\sqrt{3}\,t\right)\right) \quad \textbf{(5)}$$

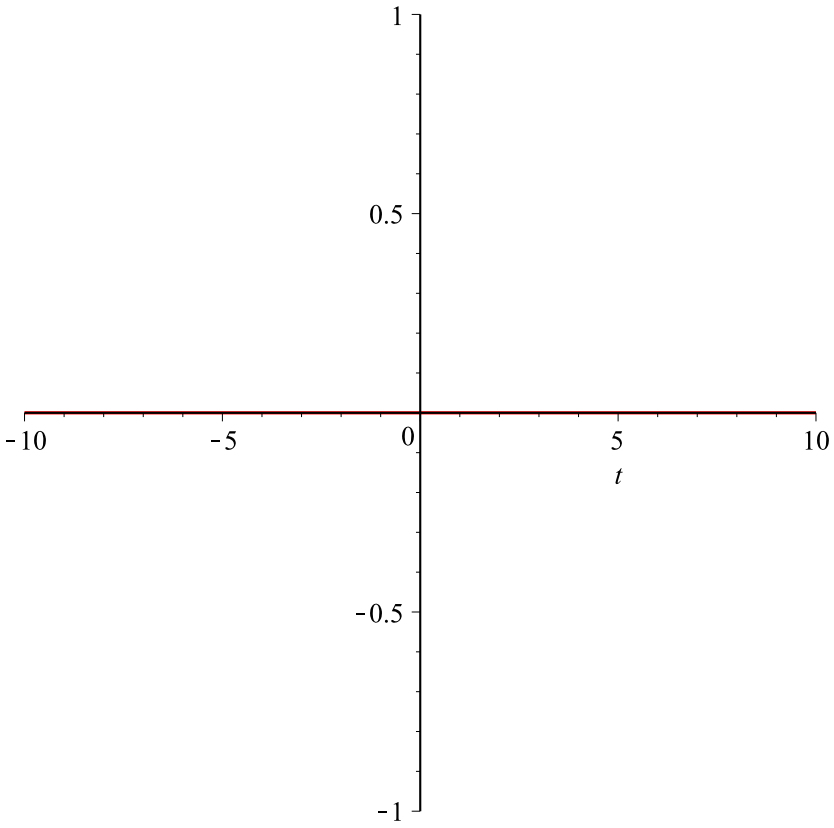
```
> FPfrac := convert(FP, parfrac, s, complex)
```

$$FPfrac := laplace(y(t), t, s) = s + 1 + \frac{1.357142856 + 1.608332893\,I}{s + 0.5000000000 + 0.8660254038\,I} + \frac{1.357142858 - 1.608332892\,I}{s + 0.5000000000 - 0.8660254038\,I} + \frac{4.285714286 - 6.122448980\,10^{-10}\,I}{s - 2.} \quad \textbf{(6)}$$

```
> invlaplace(FPfrac, s, t)
```

$$y(t) = \text{Dirac}(1,t) + \text{Dirac}(t) + (1.357142856 + 1.608332893\,I)\,e^{(-0.5000000000 - 0.8660254038\,I)t} + (1.357142858 - 1.608332892\,I)\,e^{(-0.5000000000 + 0.8660254038\,I)t} + (4.285714286 - 6.122448980\,10^{-10}\,I)\,e^{2.t} \quad \textbf{(7)}$$

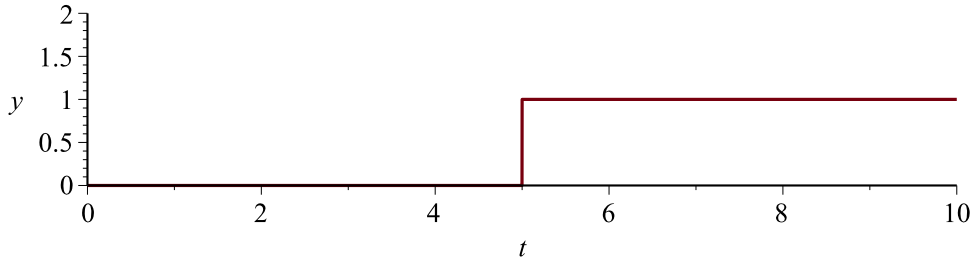
```
> plot(Dirac(t − 5))
```



> $int(\mathrm{Dirac}(t-5), t)$

$$\mathrm{Heaviside}(t-5) \tag{8}$$

> $plot(\mathrm{Heaviside}(t-5), t=0..10, y=0..2, scaling=CONSTRAINED)$


2
1.5
y
1
0.5
0
0
2
4
6
8
10
t

>

>