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

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

```
> f := 5·t^2
```

$$f := 5\,t^2 \quad \textbf{(2)}$$

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

$$F := \frac{10}{s^3} \quad \textbf{(3)}$$

```
> g := exp(4·t)
```

$$g := e^{4\,t} \quad \textbf{(4)}$$

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

$$G := \frac{1}{s-4} \quad \textbf{(5)}$$

```
> h := cos(2·t)
```

$$h := \cos(2\,t) \quad \textbf{(6)}$$

```
> H := laplace(h, t, s)
```

$$H := \frac{s}{s^2+4} \quad \textbf{(7)}$$

```
> j := sin(2·t)
```

$$j := \sin(2\,t) \quad \textbf{(8)}$$

```
> J := laplace(j, t, s)
```

$$J := \frac{2}{s^2+4} \quad \textbf{(9)}$$

```
> PP := 1/(s^2 + 2·s + 2)
```

$$PP := \frac{1}{s^2+2\,s+2} \quad \textbf{(10)}$$

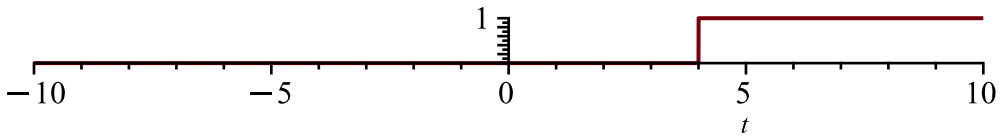
```
> pp := invlaplace(PP, s, x)
```

$$pp := e^{-x}\sin(x) \quad \textbf{(11)}$$

```
> u := Heaviside(t - 4)
```

$$u := \text{Heaviside}(t-4) \quad \textbf{(12)}$$

```
> plot(u, scaling = CONSTRAINED)
```



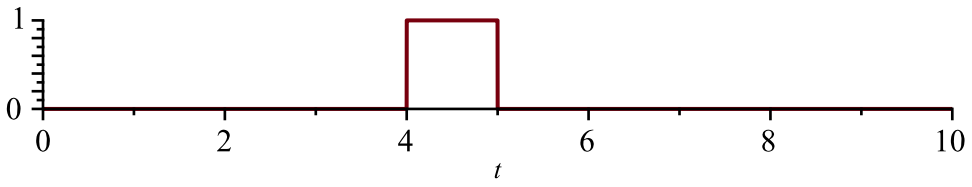
> $U := laplace(u, t, s)$

$$U := \frac{e^{-4\,s}}{s^2} \tag{13}$$

> $v := invlaplace\left(\frac{\exp(-4\cdot s)}{s} - \frac{\exp(-5\cdot s)}{s}, s, t\right)$

$$v := \text{Heaviside}(t-4) - \text{Heaviside}(t-5) \tag{14}$$

> $plot(v, t = 0..10, scaling = CONSTRAINED)$



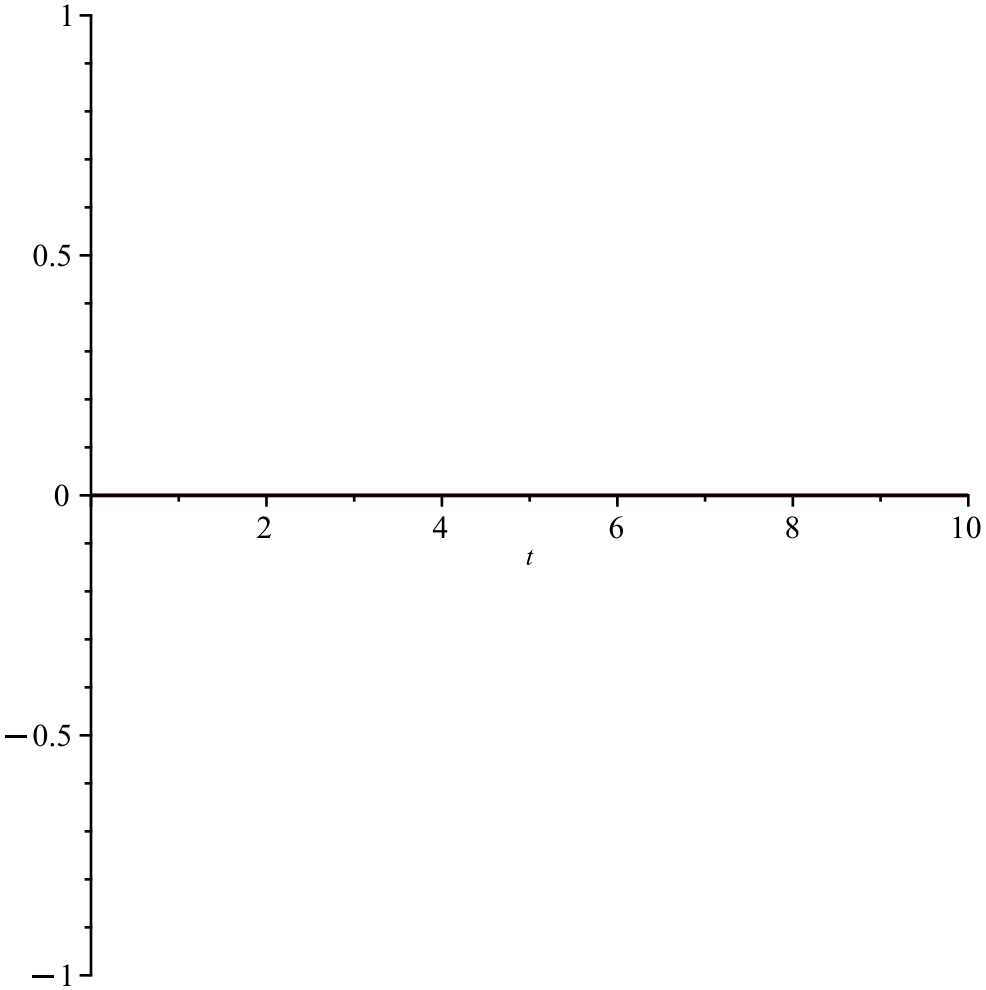

```
> d := Dirac(t - 6)
```

$$d := \mathrm{Dirac}(t - 6) \tag{15}$$

```
> DD := laplace(d, t, s)
```

$$DD := \mathrm{e}^{-6\,s} \tag{16}$$

```
> plot(d, t = 0..10)
```



> $F := \dfrac{(2\cdot s^2 - 11\cdot s + 13)}{(s-1)\cdot(s-2)\cdot(s-4)}$

$$F := \frac{2\,s^2 - 11\,s + 13}{(s-1)\,(s-2)\,(s-4)} \tag{17}$$

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

$$y := \frac{e^{2\,t}}{2} + \frac{4\,e^{t}}{3} + \frac{e^{4\,t}}{6} \tag{18}$$

> $Ecua := diff(yy(t), t\$2) - 3\cdot diff(yy(t), t) + 2\cdot yy(t) = \exp(4\cdot t)$

$$Ecua := \frac{d^2}{dt^2}\,yy(t) - 3\,\frac{d}{dt}\,yy(t) + 2\,yy(t) = e^{4\,t} \tag{19}$$

> $Comprobar := simplify(eval(subs(yy(t) = y, Ecua)))$

$$Comprobar := e^{4\,t} = e^{4\,t} \tag{20}$$

> $TranLapEcua := subs(D(yy)(0) = 3, yy(0) = 2, laplace(Ecua, t, s))$

$$TranLapEcua := s^2\,\mathcal{L}(yy(t), t, s) + 3 - 2\,s - 3\,s\,\mathcal{L}(yy(t), t, s) + 2\,\mathcal{L}(yy(t), t, s) = \frac{1}{s-4} \tag{21}$$

> $Sollaplace := simplify(isolate(TranLapEcua, laplace(yy(t), t, s)))$

(22)

$$Sollaplace := \mathcal{L}(yy(t), t, s) = \frac{2\,s^2 - 11\,s + 13}{s^3 - 7\,s^2 + 14\,s - 8} \tag{22}$$

>