

```
> restart
```

$$F := \frac{s}{s^2 + s + 1}$$

$$F := \frac{s}{s^2 + s + 1} \quad (1)$$

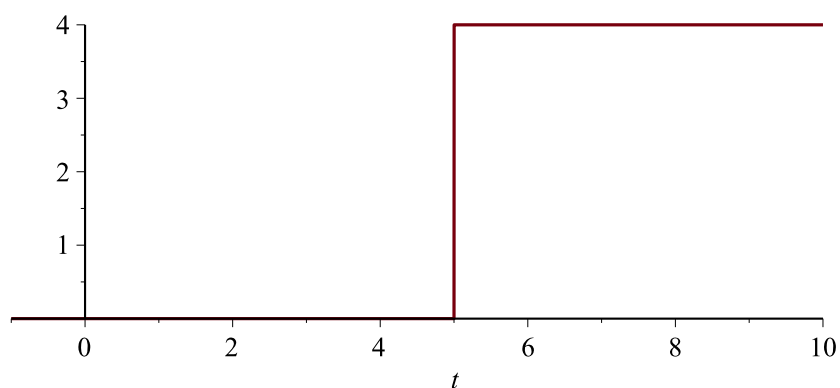
```
> with(inttrans) :
> f := expand(invlaplace(F, s, t))
```

$$f := e^{-\frac{1}{2}t} \cos\left(\frac{1}{2}\sqrt{3}t\right) - \frac{1}{3}e^{-\frac{1}{2}t}\sqrt{3}\sin\left(\frac{1}{2}\sqrt{3}t\right) \quad (2)$$

```
> restart
> with(inttrans) :
> g := 4· Heaviside(t - 5)
```

$$g := 4 \text{ Heaviside}(t - 5) \quad (3)$$

```
> plot(g, t=-1..10, scaling=CONSTRAINED)
```



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

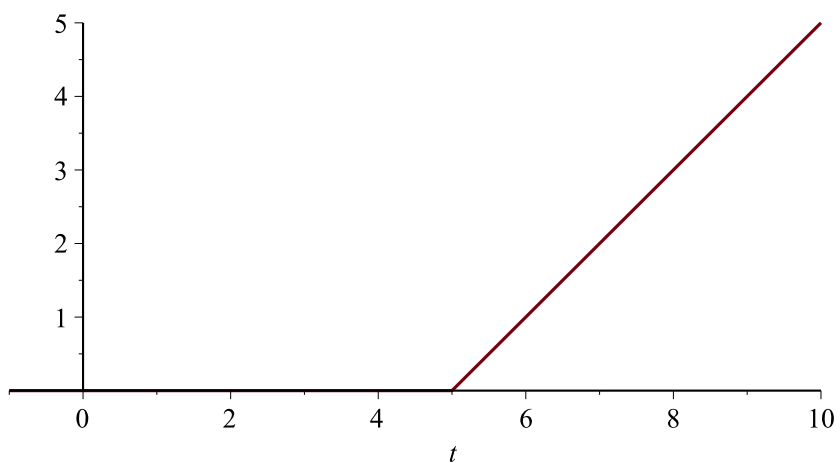
$$G := \frac{4e^{-5s}}{s} \quad (4)$$

> $r := (t - 5) \cdot \text{Heaviside}(t - 5)$

$r := \text{Heaviside}(t - 5) (t - 5)$

(5)

> $\text{plot}(r, t = -1 .. 10, \text{scaling} = \text{CONSTRAINED})$



> $R := \text{laplace}(r, t, s)$

$R := \frac{e^{-5s}}{s^2}$

(6)

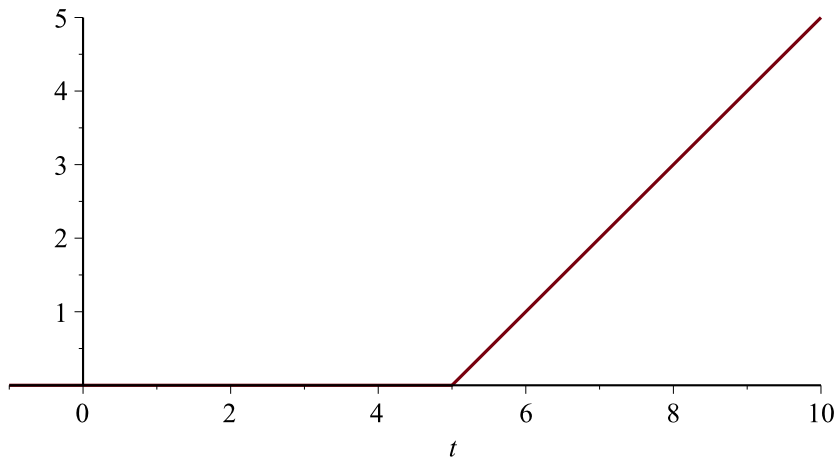
>

> $h := \text{Heaviside}(t - 5) \cdot (t - 5)$

$h := \text{Heaviside}(t - 5) (t - 5)$

(7)

> $\text{plot}(h, t = -1 .. 10, \text{scaling} = \text{CONSTRAINED})$



```
> j := Dirac(t - 5)
```

$$j := \text{Dirac}(t - 5)$$

(8)

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

$$J := e^{-5s}$$

(9)

```
> restart
```

```
> with(inttrans) :
```

```
> II := (117*s*exp(-5*s)) / ((s + 10000)*(s^2 + 3600*pi^2))
```

$$II := \frac{117 s e^{-5s}}{(s + 10000) (3600 \pi^2 + s^2)}$$

(10)

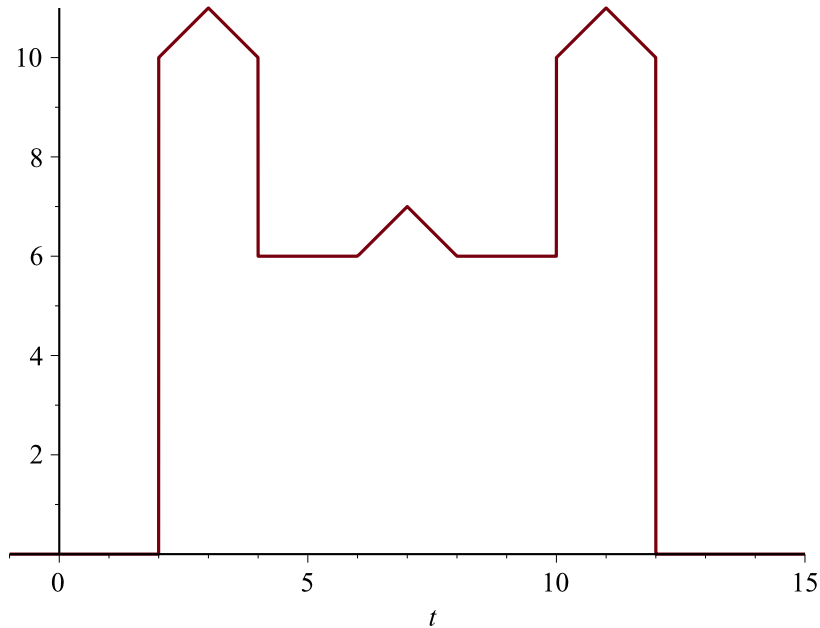
```
> ii := simplify(invlaplace(II, s, t)) :
```

```
> restart
```

```
> Castillo := 10*Heaviside(t-2) + (t-2)*Heaviside(t-2) - 2*(t-3)*Heaviside(t-3)
+ (t-4)*Heaviside(t-4) - 4*Heaviside(t-4) + (t-6)*Heaviside(t-6) - 2*(t-7)
*Heaviside(t-7) + (t-8)*Heaviside(t-8) + 4*Heaviside(t-10) + (t-10)
*Heaviside(t-10) - 2*(t-11)*Heaviside(t-11) + (t-12)*Heaviside(t-12) - 10
*Heaviside(t-12); plot(Castillo, t=-1..15, scaling=CONSTRAINED)
```

```
Castillo := 10 Heaviside(t-2) + (t-2) Heaviside(t-2) - 2 (t-3) Heaviside(t-3) + (t
```

$- 4) \text{Heaviside}(t - 4) - 4 \text{Heaviside}(t - 4) + (t - 6) \text{Heaviside}(t - 6) - 2 (t$
 $- 7) \text{Heaviside}(t - 7) + (t - 8) \text{Heaviside}(t - 8) + 4 \text{Heaviside}(t - 10) + (t$
 $- 10) \text{Heaviside}(t - 10) - 2 (t - 11) \text{Heaviside}(t - 11) + (t - 12) \text{Heaviside}(t - 12)$
 $- 10 \text{Heaviside}(t - 12)$



> *with(inttrans) :*

> *CASTILLO := laplace(Castillo, t, s)*

$$\begin{aligned}
 \text{CASTILLO} := & \frac{e^{-2s} + e^{-12s} - 2e^{-11s} + e^{-10s} + e^{-8s} - 2e^{-7s} + e^{-6s} + e^{-4s} - 2e^{-3s}}{s^2} \\
 & + \frac{2(5e^{-2s} - 5e^{-12s} + 2e^{-10s} - 2e^{-4s})}{s}
 \end{aligned}$$

(11)

> *plot(CASTILLO, s=0..15)*

