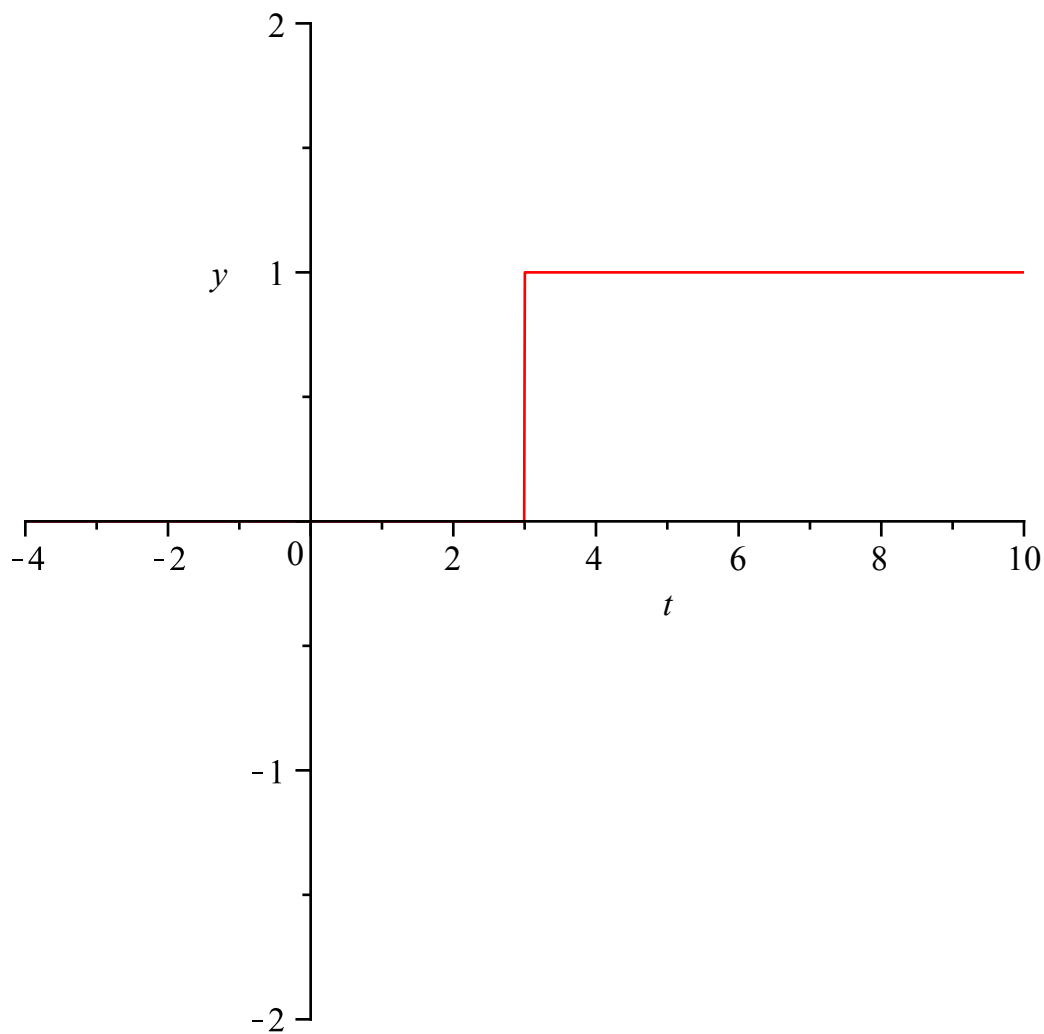


```

> restart
> f := Heaviside(t - 3)
f := Heaviside(t - 3)
> plot(f, t = -4 .. 10, y = -2 .. 2)

```

(1)



```

> with(inttrans) :
> Uni := 1
Uni := 1

```

(2)

```

> U := laplace(Uni, t, s)
U := 1/s

```

(3)

```

> f;
Heaviside(t - 3)

```

(4)

```

> F := laplace(f, t, s)
F := e^(-3 s)/s

```

(5)

```

> G := exp(-3 s)/(s * 3)

```

(6)

$$G := \frac{e^{-3s}}{s^3} \quad (6)$$

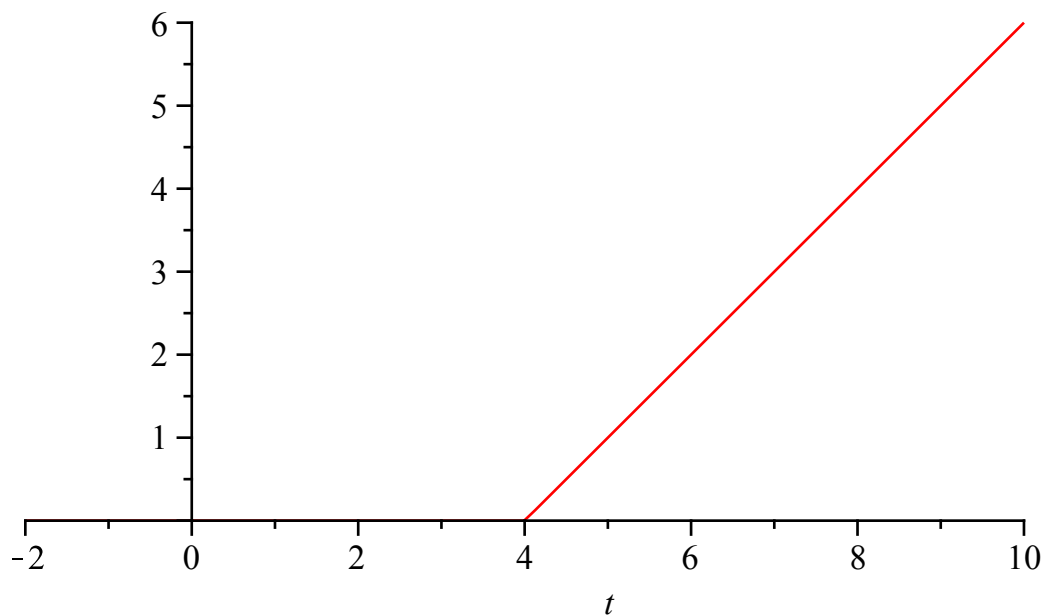
```
> g := invlaplace(G, s, t)
```

$$g := \frac{1}{2} \text{Heaviside}(t-3) (t-3)^2 \quad (7)$$

```
> r := (t-4)·Heaviside(t-4)
```

$$r := (t-4) \text{Heaviside}(t-4) \quad (8)$$

```
> plot(r, t=-2..10, scaling=CONSTRAINED)
```



```
> R := laplace(r, t, s)
```

$$R := \frac{e^{-4s}}{s^2} \quad (9)$$

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

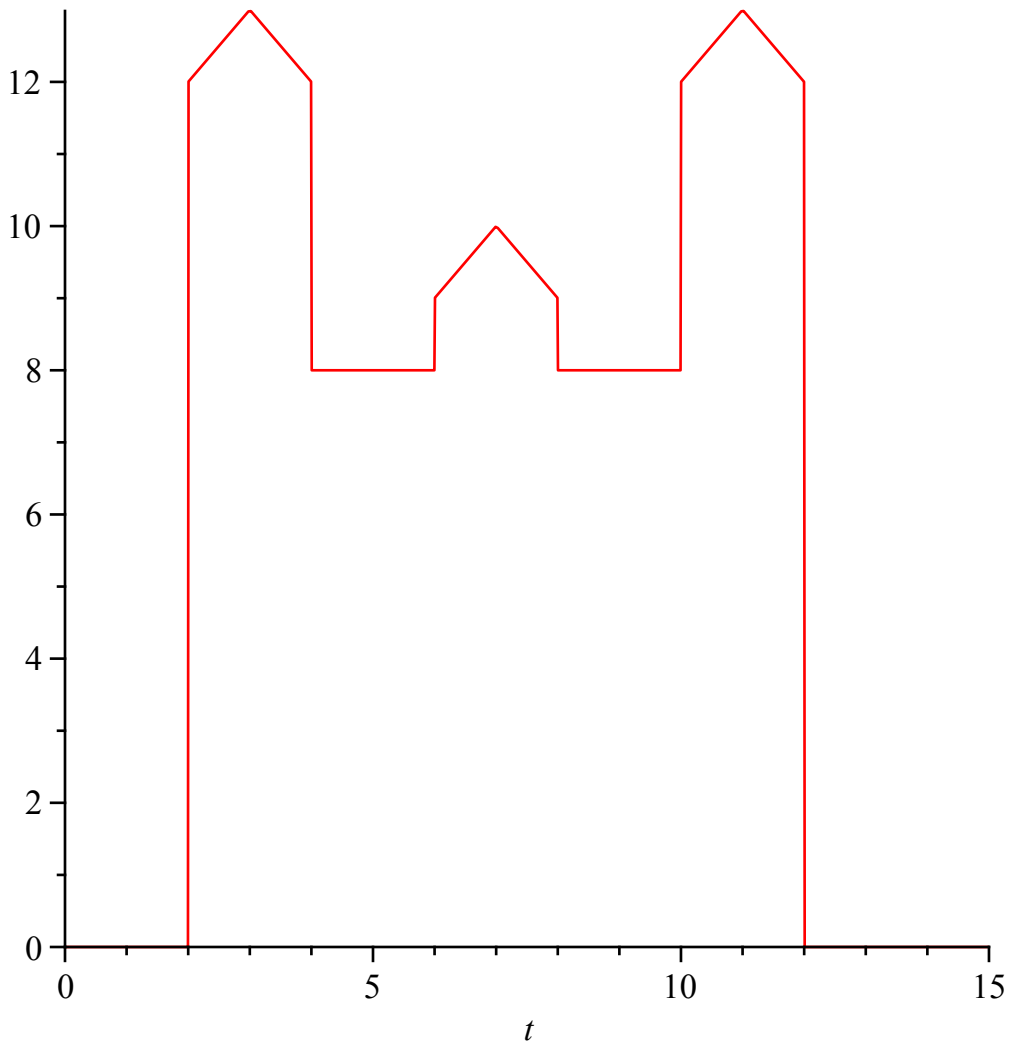
$$\frac{1}{s^2} \quad (10)$$

```
> restart
```

```
> Castle := 12·Heaviside(t-2) + (t-2)·Heaviside(t-2) - 2·(t-3)·Heaviside(t-3)
+ (t-4)·Heaviside(t-4) - 4·Heaviside(t-4) + Heaviside(t-6) + (t-6)
```

$\cdot \text{Heaviside}(t - 6) - 2 \cdot (t - 7) \cdot \text{Heaviside}(t - 7) + (t - 8) \cdot \text{Heaviside}(t - 8)$   
 $- \text{Heaviside}(t - 8) + 4 \cdot \text{Heaviside}(t - 10) + (t - 10) \cdot \text{Heaviside}(t - 10) - 2 \cdot (t - 11)$   
 $\cdot \text{Heaviside}(t - 11) + (t - 12) \cdot \text{Heaviside}(t - 12) - 12 \cdot \text{Heaviside}(t - 12); \text{plot}(\text{Castle}, t$   
 $= 0 \dots 15)$

$\text{Castle} := 12 \text{Heaviside}(t - 2) + (t - 2) \text{Heaviside}(t - 2) - 2 (t - 3) \text{Heaviside}(t - 3) + (t$   
 $- 4) \text{Heaviside}(t - 4) - 4 \text{Heaviside}(t - 4) + \text{Heaviside}(t - 6) + (t - 6) \text{Heaviside}(t$   
 $- 6) - 2 (t - 7) \text{Heaviside}(t - 7) + (t - 8) \text{Heaviside}(t - 8) - \text{Heaviside}(t - 8)$   
 $+ 4 \text{Heaviside}(t - 10) + (t - 10) \text{Heaviside}(t - 10) - 2 (t - 11) \text{Heaviside}(t - 11) + (t$   
 $- 12) \text{Heaviside}(t - 12) - 12 \text{Heaviside}(t - 12)$



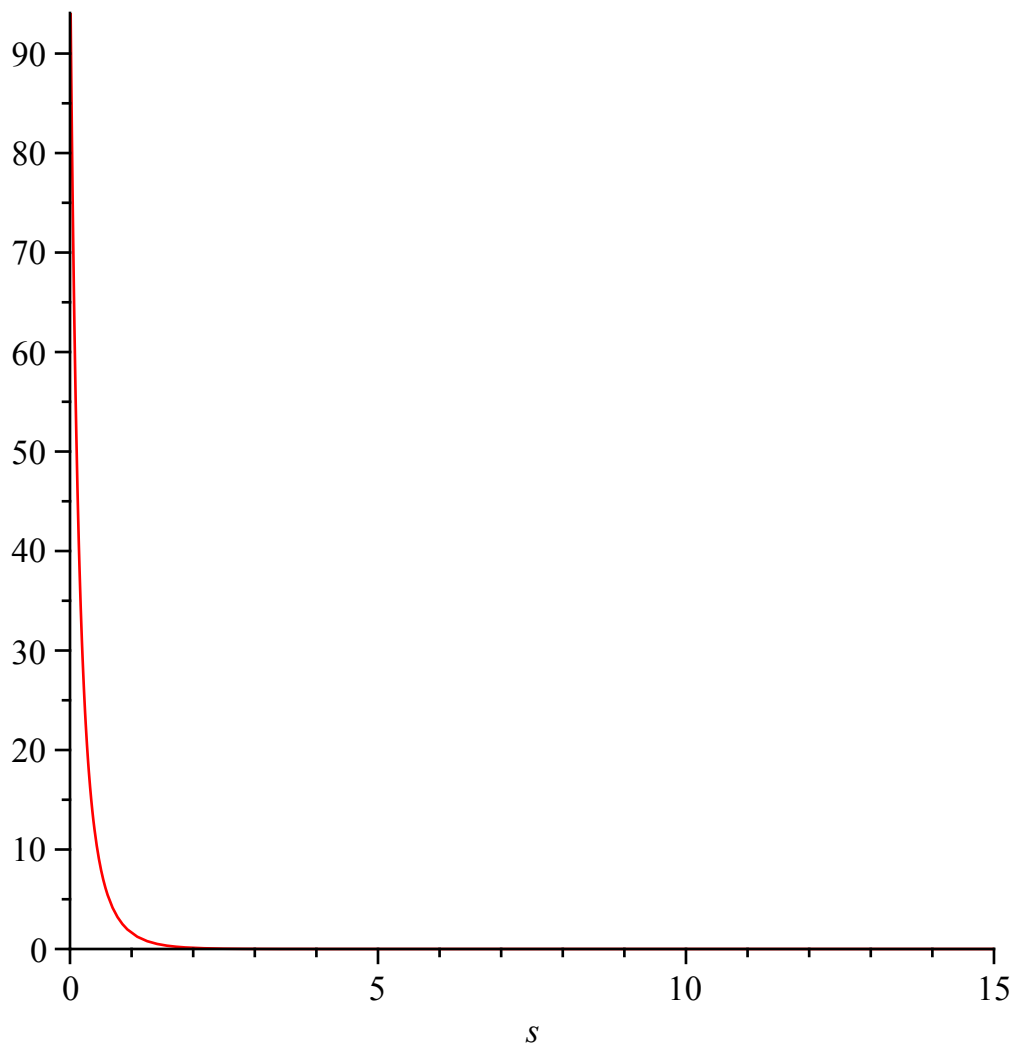
> with(inttrans) :

> CASTLE := laplace(Castle, t, s)

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

(11)

> plot(CASTLE, s = 0 .. 15)

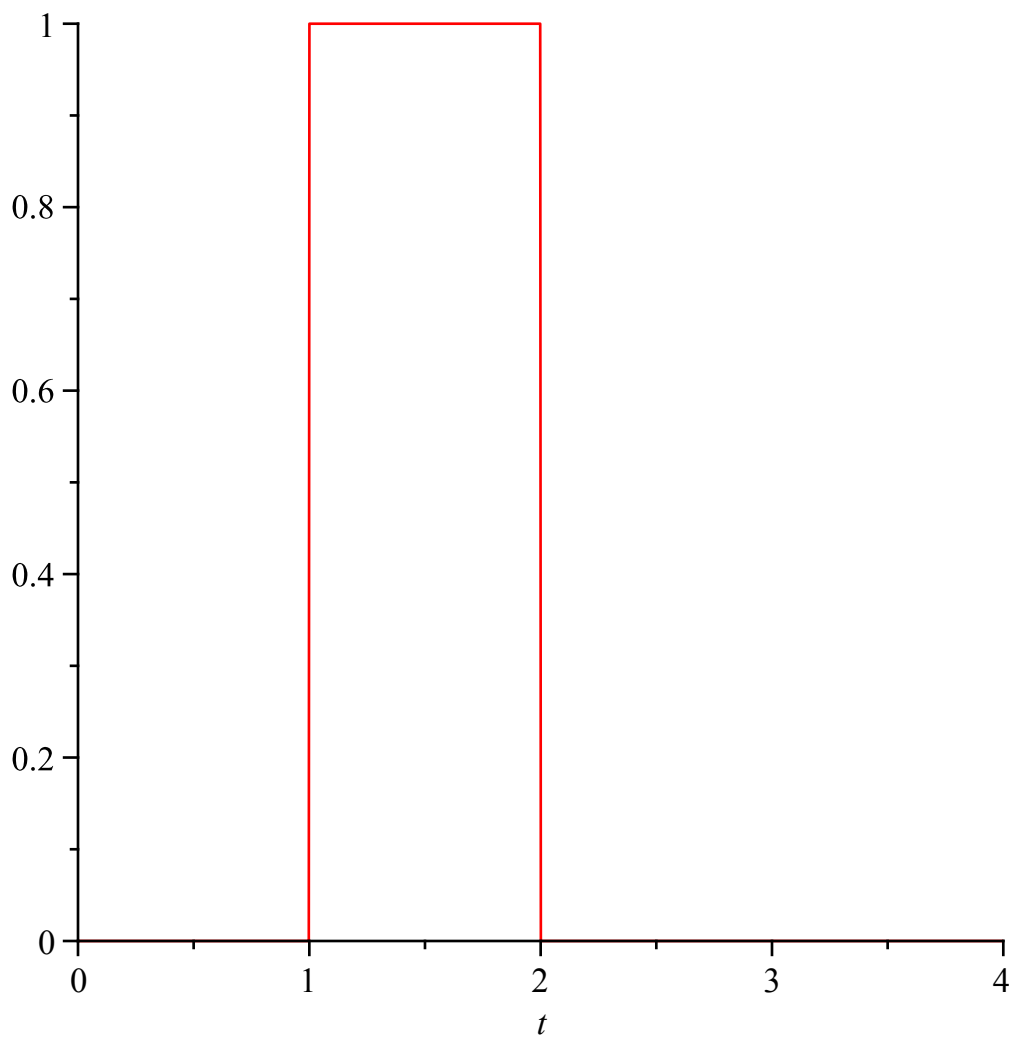


```
> Bit := Heaviside(t - 1) - Heaviside(t - 2)
```

```
Bit := Heaviside(t - 1) - Heaviside(t - 2)
```

(12)

```
> plot(Bit, t = 0 .. 4)
```



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

*Dir* := Dirac(*t* - 5)

**(13)**

```
> DIR := laplace(Dir, t, s)
```

*DIR* := e<sup>-5*s*</sup>

**(14)**

```
>
```

```
>
```

```
>
```

```
>
```