> *restart*

> $Castillo := 5 \cdot \text{Heaviside}(t-2) + (t-2) \cdot \text{Heaviside}(t-2) - 2 \cdot (t-3) \cdot \text{Heaviside}(t-3)$
$+ (t-4) \cdot \text{Heaviside}(t-4) - 2 \cdot \text{Heaviside}(t-4) + \text{Heaviside}(t-6) + (t-6)$
$\cdot \text{Heaviside}(t-6) - 2 \cdot (t-7) \cdot \text{Heaviside}(t-7) + (t-8) \cdot \text{Heaviside}(t-8)$
$- \text{Heaviside}(t-8) + 5 \cdot \text{Heaviside}(t-10) + (t-10) \cdot \text{Heaviside}(t-10) - 2 \cdot (t-11)$
$\cdot \text{Heaviside}(t-11) + (t-12) \cdot \text{Heaviside}(t-12) - 8 \cdot \text{Heaviside}(t-12); plot(Castillo, t$
$= 0 .. 15, scaling = CONSTRAINED)$

$Castillo := 5\,\text{Heaviside}(t-2) + (t-2)\,\text{Heaviside}(t-2) - 2\,(t-3)\,\text{Heaviside}(t-3) + (t$
$- 4)\,\text{Heaviside}(t-4) - 2\,\text{Heaviside}(t-4) + \text{Heaviside}(t-6) + (t-6)\,\text{Heaviside}(t-6)$
$- 2\,(t-7)\,\text{Heaviside}(t-7) + (t-8)\,\text{Heaviside}(t-8) - \text{Heaviside}(t-8) + 5\,\text{Heaviside}(t$
$- 10) + (t-10)\,\text{Heaviside}(t-10) - 2\,(t-11)\,\text{Heaviside}(t-11) + (t-12)\,\text{Heaviside}(t$
$- 12) - 8\,\text{Heaviside}(t-12)$
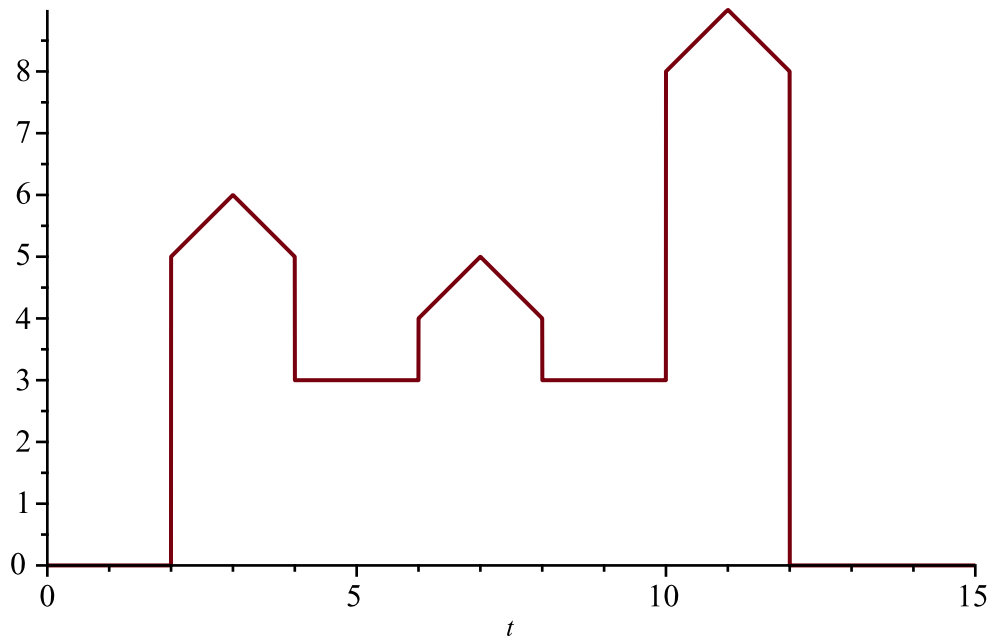
> $with(inttrans):$

> $CastilloTransLapla := laplace(Castillo, t, s)$

$$CastilloTransLapla := \frac{e^{-2s} + e^{-12s} - 2e^{-11s} + e^{-10s} + e^{-8s} - 2e^{-7s} + e^{-6s} + e^{-4s} - 2e^{-3s}}{s^2} \qquad \textbf{(1)}$$
$$+ \frac{5e^{-2s} - 8e^{-12s} + 5e^{-10s} - e^{-8s} + e^{-6s} - 2e^{-4s}}{s}$$

```
> restart
> with(inttrans) :
> Escalon := laplace(Heaviside(t − 2), t, s)
```

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

```
> Rampa := laplace((t − 2)·Heaviside(t − 2), t, s)
```

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

```
> delta := laplace(Dirac(t − 2), t, s)
```

$$\delta := e^{-2s} \tag{4}$$

```
> Circuito := 1/10 ·diff(i(t), t) + 10·i(t) = Heaviside(t − 5)·120·cos(60·t)
```

$$Circuito := \frac{\frac{d}{dt}\,i(t)}{10} + 10\,i(t) = 120\,\text{Heaviside}(t − 5)\,\cos(60\,t) \tag{5}$$

```
> CondIni := i(0) = 0
```

$$CondIni := i(0) = 0 \tag{6}$$

```
> CircuitoStd := lhs(Circuito)·10 = rhs(Circuito)·10
```

$$CircuitoStd := \frac{d}{dt}\,i(t) + 100\,i(t) = 1200\,\text{Heaviside}(t − 5)\,\cos(60\,t) \tag{7}$$

```
> CircuitTransLapl := subs(CondIni, laplace(CircuitoStd, t, s))
```
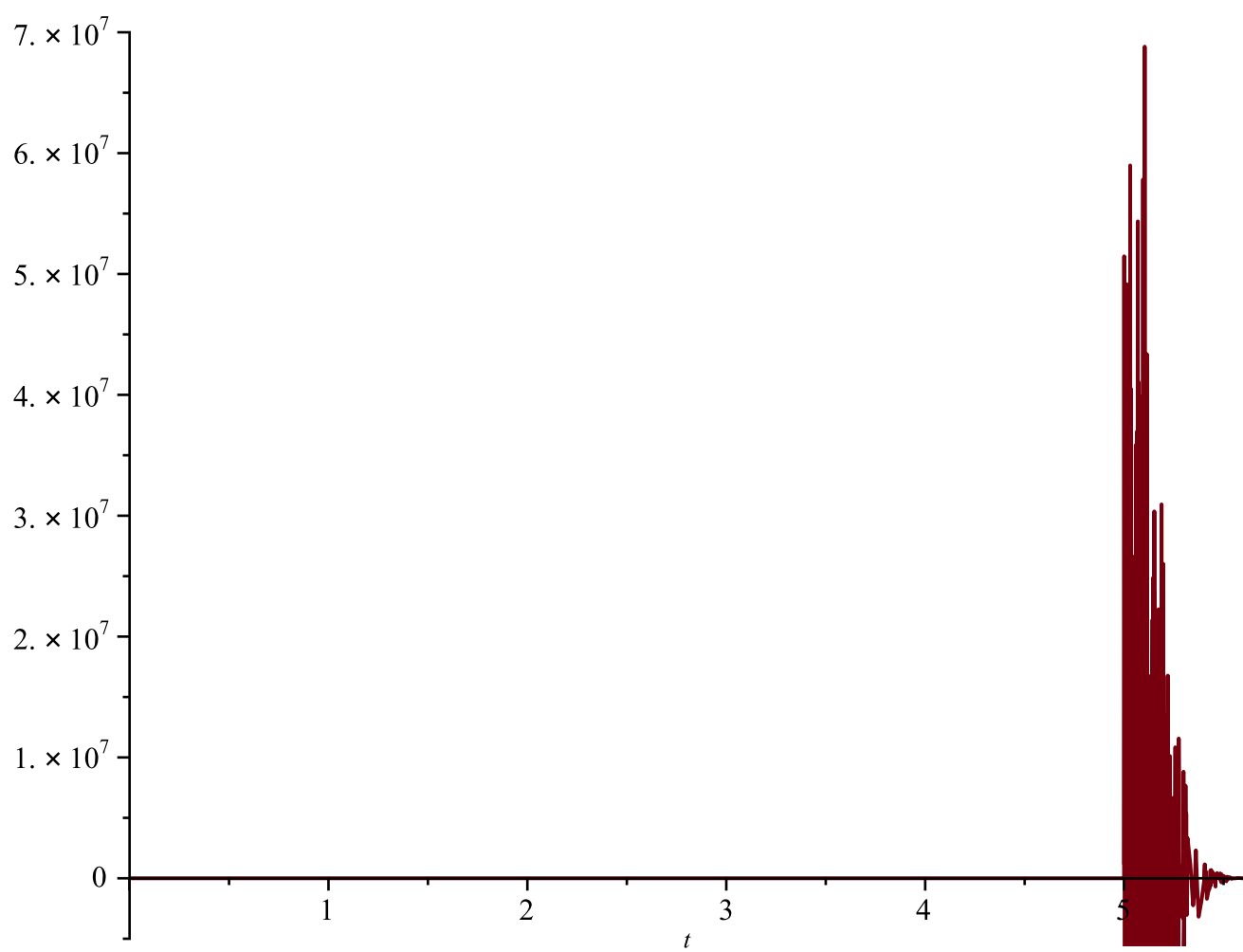
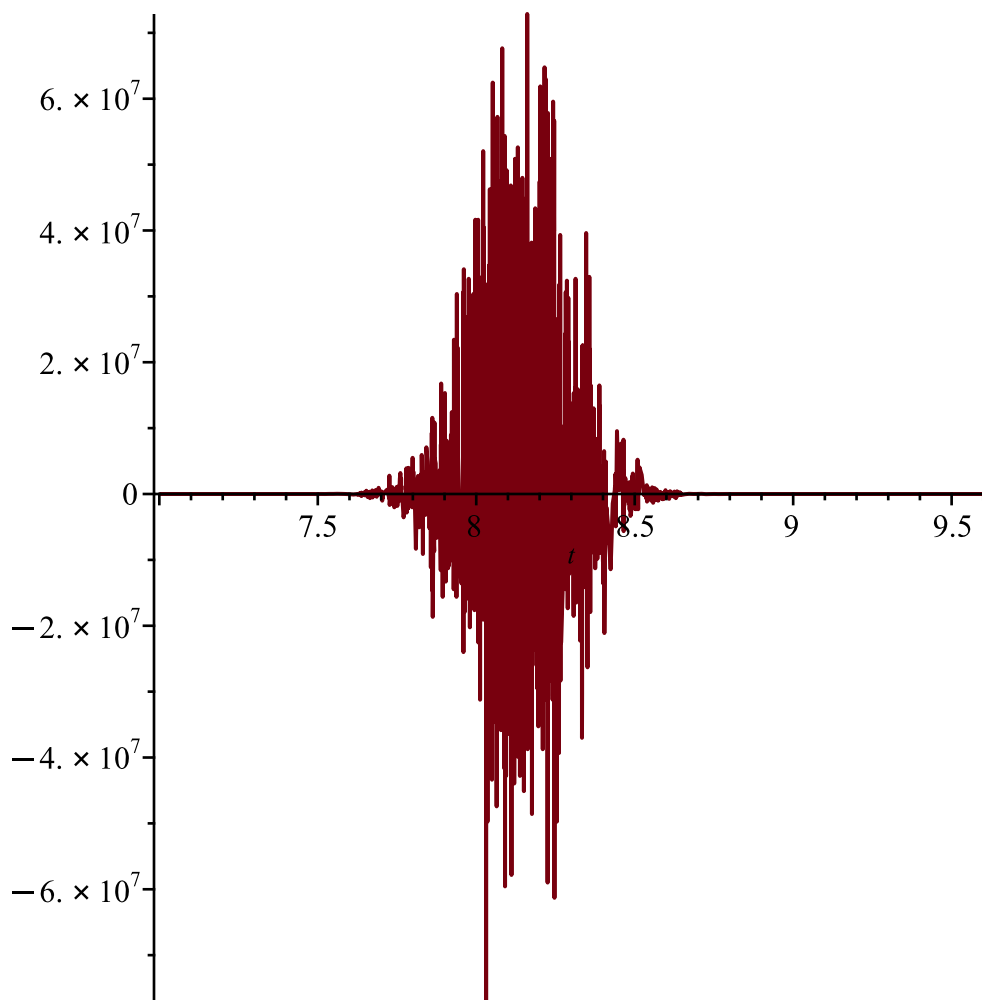$$CircuitTransLapl := s\,\mathcal{L}(i(t), t, s) + 100\,\mathcal{L}(i(t), t, s) =$$
$$-\frac{1200\,e^{-5s}\,(−\cos(300)\,s + 60\,\sin(300))}{s^2 + 3600} \tag{8}$$

```
> SolucionTransLap := isolate(CircuitTransLapl, laplace(i(t), t, s))
```

$$SolucionTransLap := \mathcal{L}(i(t), t, s) = -\frac{1200\,e^{-5s}\,(−\cos(300)\,s + 60\,\sin(300))}{(s^2 + 3600)\,(s + 100)} \tag{9}$$

```
> Solucion := simplify(invlaplace(SolucionTransLap, s, t)) : plot(rhs(Solucion), t = 0 ..5.6);
      plot(rhs(Solucion), t = 7 ..9.6)
```