```
> restart
> EcuacionUno := diff(v(t), t) = -K·v(t)··2
```

$$EcuacionUno := \frac{d}{dt} v(t) = -K\, v(t)^2 \tag{1}$$

```
> CondicionUno := v(0) = 200
```

$$CondicionUno := v(0) = 200 \tag{2}$$

```
> SolPartUno := dsolve({EcuacionUno, CondicionUno})
```

$$SolPartUno := v(t) = \frac{200}{1 + 200\, K\, t} \tag{3}$$

```
> EcuacionDos := diff(s(t), t) = rhs(SolPartUno)
```

$$EcuacionDos := \frac{d}{dt} s(t) = \frac{200}{1 + 200\, K\, t} \tag{4}$$

```
> CondicionDos := s(0) = 0
```

$$CondicionDos := s(0) = 0 \tag{5}$$

```
> SolPartDos := dsolve({EcuacionDos, CondicionDos})
```

$$SolPartDos := s(t) = \frac{\ln(1 + 200\, K\, t)}{K} \tag{6}$$

```
> TiempoFinal := isolate(rhs(SolPartDos) = 1/10, t)
```

$$TiempoFinal := t = \frac{1}{200}\, \frac{e^{\frac{1}{10} K} - 1}{K} \tag{7}$$

```
> Parametro := isolate(subs(t = rhs(TiempoFinal), rhs(SolPartUno) = 80), K)
```

$$Parametro := K = 10 \ln\left(\frac{5}{2}\right) \tag{8}$$

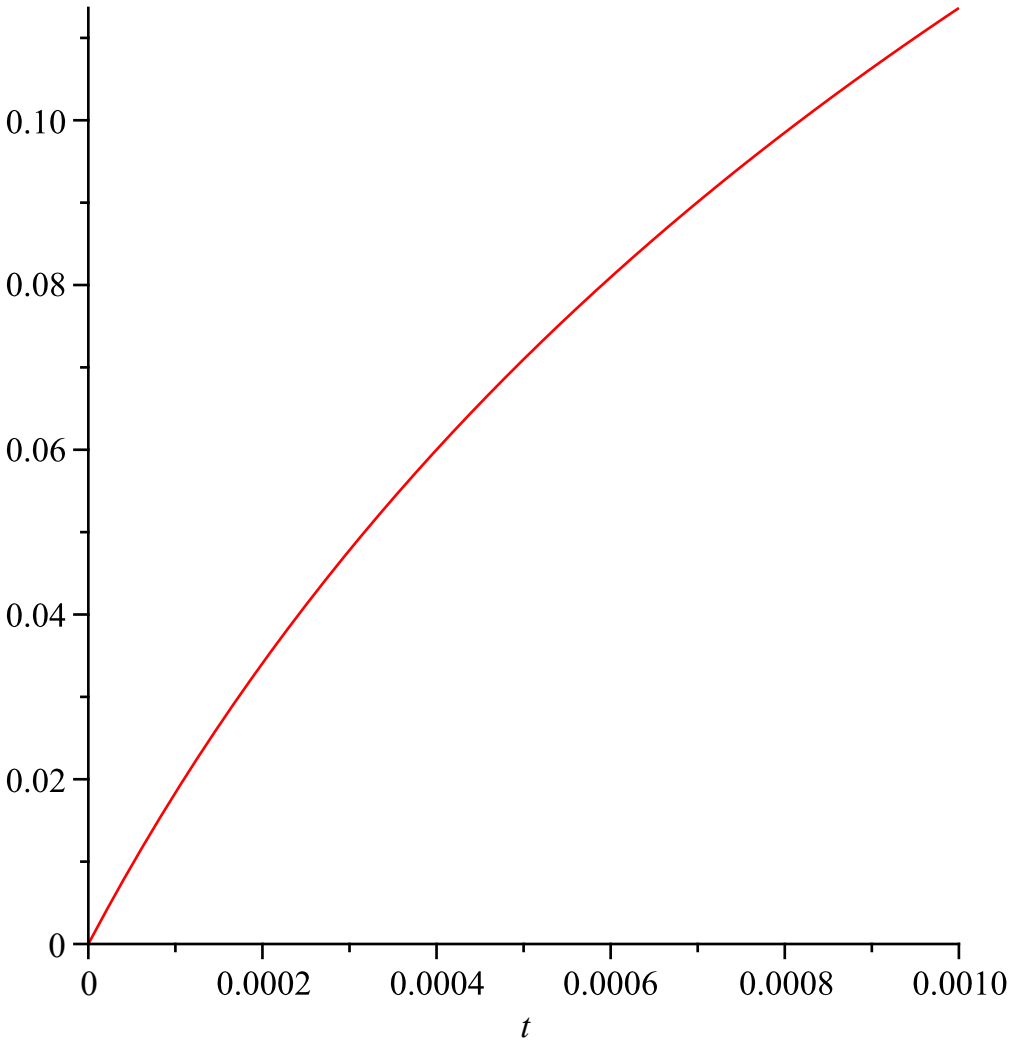
```
> SolucionUnoFinal := subs(K = rhs(Parametro), SolPartUno)
```

$$SolucionUnoFinal := v(t) = \frac{200}{1 + 2000 \ln\left(\frac{5}{2}\right) t} \tag{9}$$

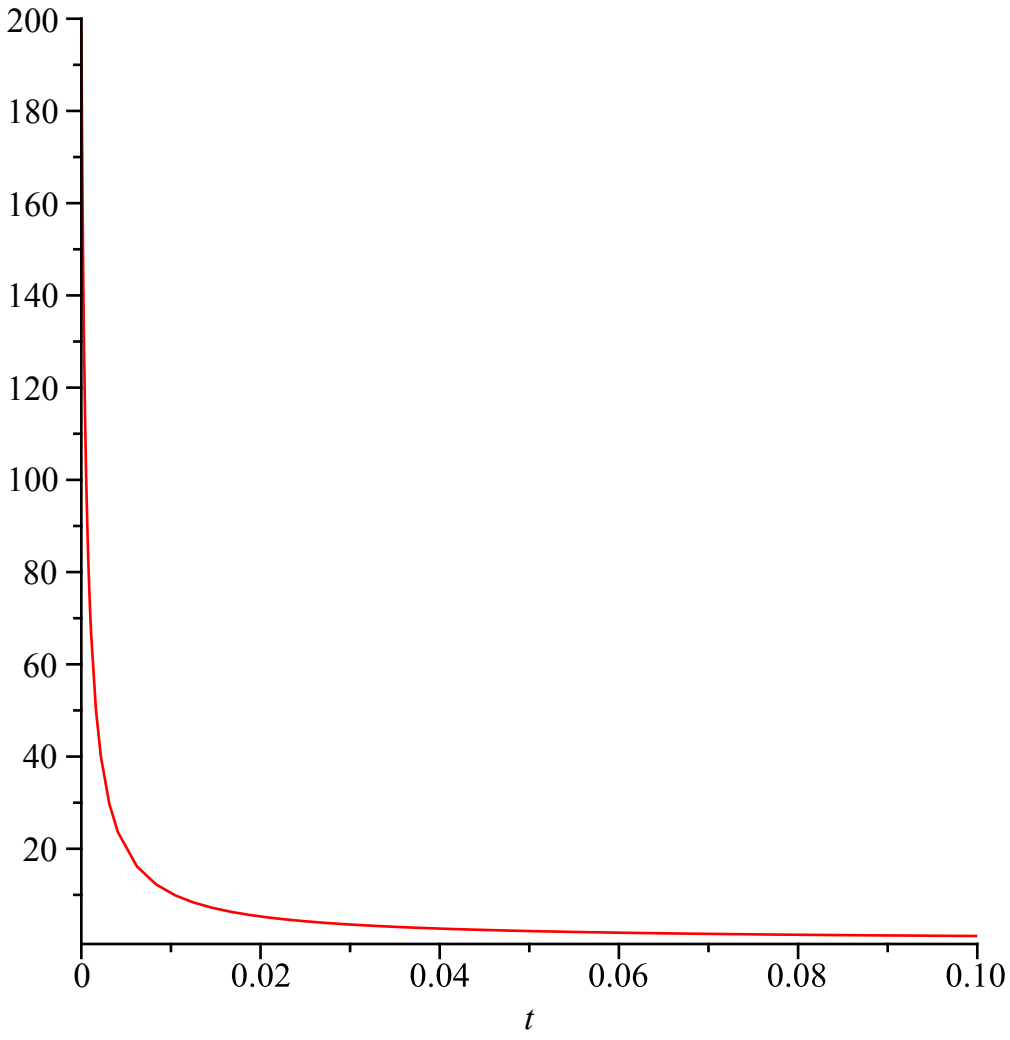
```
> SolucionDosFinal := subs(K = rhs(Parametro), SolPartDos)
```

$$SolucionDosFinal := s(t) = \frac{1}{10}\, \frac{\ln\left(1 + 2000 \ln\left(\frac{5}{2}\right) t\right)}{\ln\left(\frac{5}{2}\right)} \tag{10}$$

```
> plot(rhs(SolucionDosFinal), t = 0..0.001)
```




```
> plot(rhs(SolucionUnoFinal), t = 0 ..0.1)
```



> *SolucionUnoFinal*

$$v(t) = \frac{200}{1 + 2000 \ln\left(\frac{5}{2}\right) t} \tag{11}$$

> *TiempoMitadVelocidad* := *solve*(*rhs*(*SolucionUnoFinal*) = 40, *t*); *evalf*(%, 4)

$$TiempoMitadVelocidad := \frac{1}{500 \ln\left(\frac{5}{2}\right)}$$

$$0.002182 \tag{12}$$

> *GruesoMitadVelocidad* := *subs*(*t* = *TiempoMitadVelocidad*, *rhs*(*SolucionDosFinal*));
evalf(%, 4)

$$GruesoMitaVelocidad := \frac{1}{10} \frac{\ln(5)}{\ln\left(\frac{5}{2}\right)}$$

$$0.1756 \tag{13}$$

> *TiempoCuartoVelocidad* := *solve*(*rhs*(*SolucionUnoFinal*) = 20, *t*); *evalf*(%, 4)

$$TiempoCuartoVelocidad := \frac{9}{2000 \ln\left(\frac{5}{2}\right)}$$

$$0.004910 \quad \textbf{(14)}$$

```
> GruesoCuartoVelocidad := subs(t = TiempoCuartoVelocidad, rhs(SolucionDosFinal));
  evalf(%, 4)
```

$$GruesoCuartoVelocidad := \frac{1}{10} \frac{\ln(10)}{\ln\left(\frac{5}{2}\right)}$$

$$0.2513 \quad \textbf{(15)}$$

```
>
```