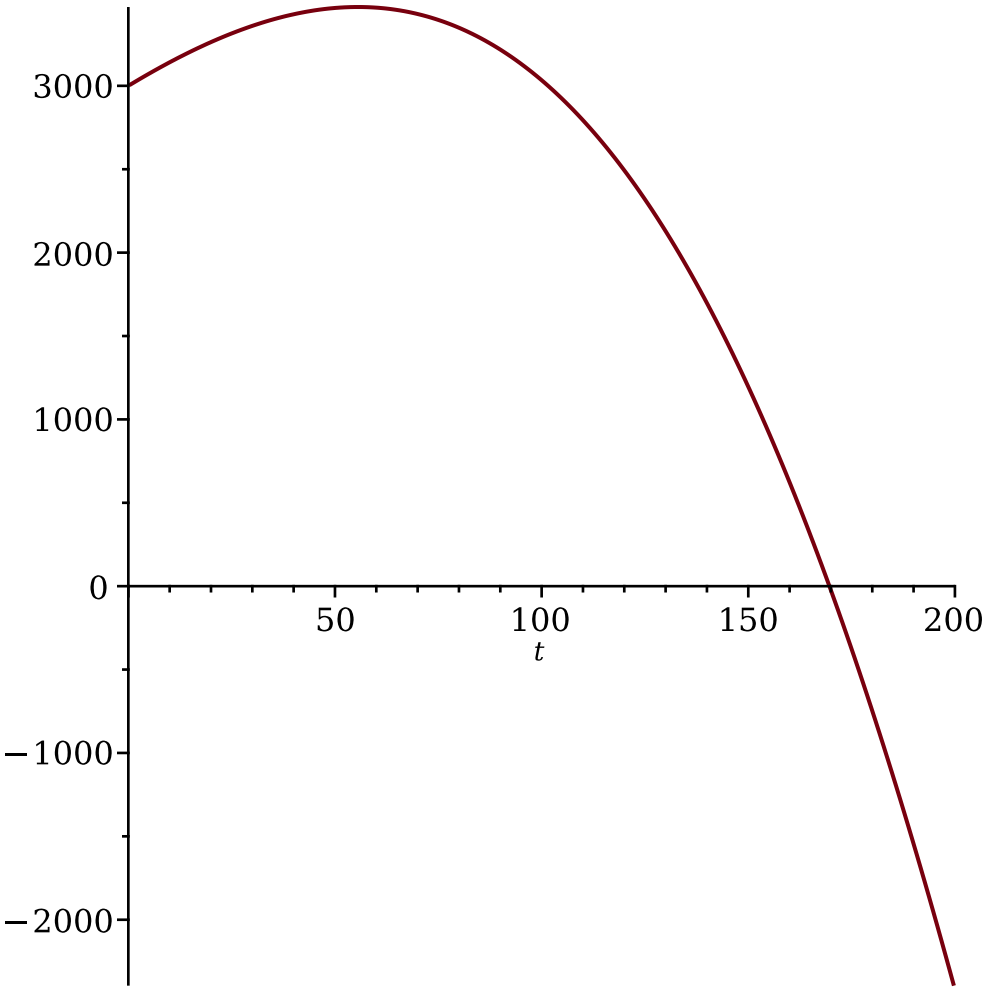
```
> restart:
  # A
> eq := D(D(M))(t) = 0.011·D(M)(t) − 0.00011·M(t)
```

$$eq := \mathrm{D}^{(2)}(M)(t) = 0.011\,\mathrm{D}(M)(t) - 0.00011\,M(t) \tag{1}$$

```
> sol := rhs(dsolve({D(M)(0) = 15, M(0) = 3000, eq}))
```

$$sol := -\frac{3000\,\mathrm{e}^{\frac{11\,t}{2000}}\left(\sqrt{319}\,\sin\left(\frac{\sqrt{319}\,t}{2000}\right) - 319\cos\left(\frac{\sqrt{319}\,t}{2000}\right)\right)}{319} \tag{2}$$

```
> plot(sol, t = 0..200)
```




```
> evalf(solve(sol = 0, t))
```

$$169.6323664 \tag{3}$$

```
> #B
> restart:
> eq := D(D(M))(t) = 0.011·D(M)(t) − 0.00011·M(t)
```

$$eq := \mathrm{D}^{(2)}(M)(t) = 0.011\,\mathrm{D}(M)(t) - 0.00011\,M(t) \tag{4}$$

```
> sol := rhs(dsolve({D(M)(0) = 30 − k, M(0) = 3000, eq}))
```

$$sol := -\frac{2000\, e^{\frac{11\,t}{2000}} \left(\sqrt{319} \left(-\frac{27}{2} + k \right) \sin\left(\frac{\sqrt{319}\, t}{2000} \right) - \frac{957 \cos\left(\frac{\sqrt{319}\, t}{2000} \right)}{2} \right)}{319} \quad (5)$$

```
> sol := subs(t = 100, sol)
```

$$sol := -\frac{2000\, e^{\frac{11}{20}} \left(\sqrt{319} \left(-\frac{27}{2} + k \right) \sin\left(\frac{\sqrt{319}}{20} \right) - \frac{957 \cos\left(\frac{\sqrt{319}}{20} \right)}{2} \right)}{319} \quad (6)$$

```
> evalf(solve(sol = 0, k))
```

$$35.06599836 \quad (7)$$

```
>
```