```
> restart
> EcuacionLibre := diff(x(t), t$2) + 16·x(t) = 0;
```

$$EcuacionLibre := \frac{d^2}{dt^2} x(t) + 16\, x(t) = 0 \quad \textbf{(1)}$$

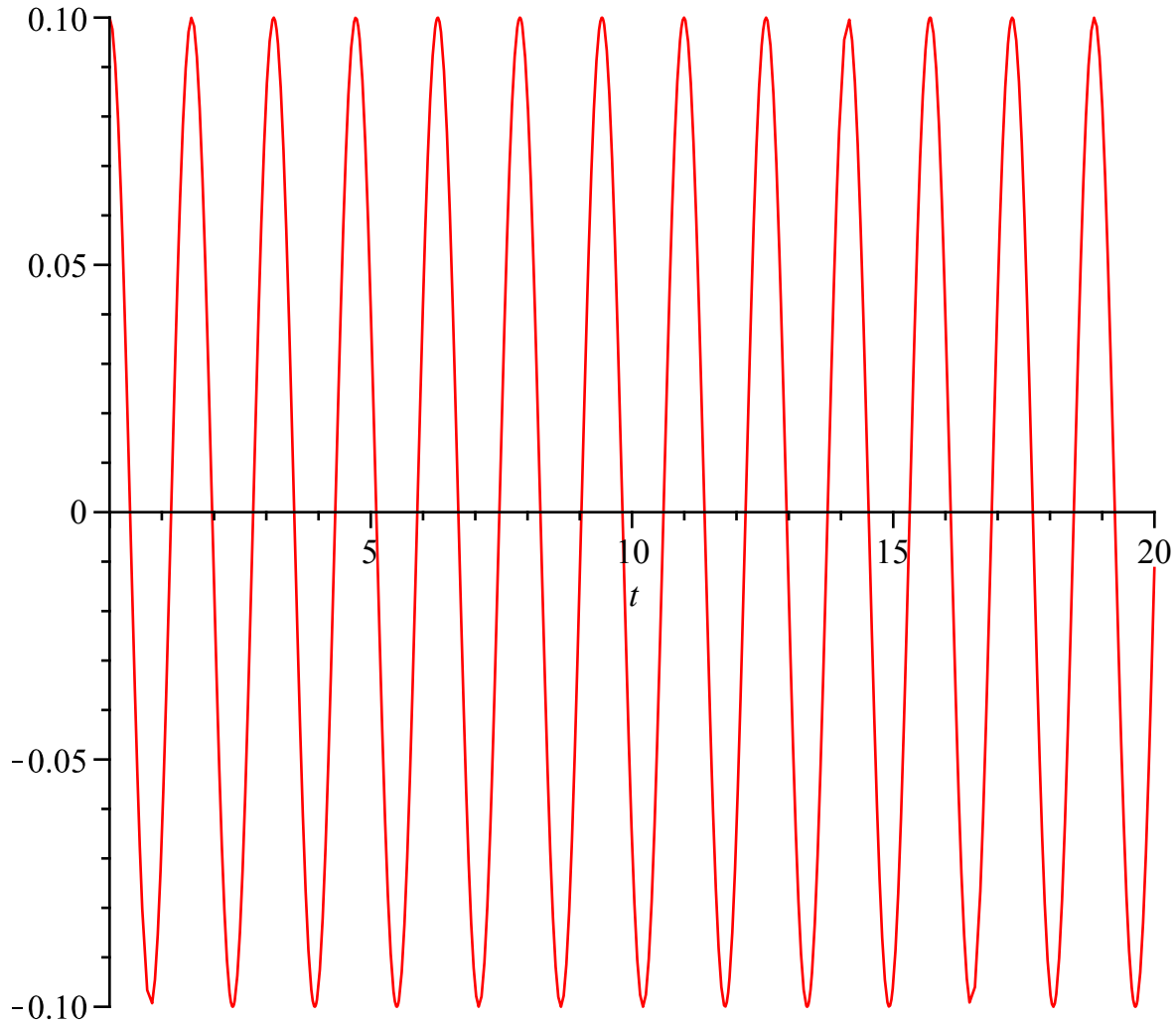
```
> Condiciones := x(0) = 1/10, D(x)(0) = 0
```

$$Condiciones := x(0) = \frac{1}{10}, \mathrm{D}(x)(0) = 0 \quad \textbf{(2)}$$

```
> SolucionParticular := dsolve({EcuacionLibre, Condiciones})
```

$$SolucionParticular := x(t) = \frac{1}{10}\cos(4\, t) \quad \textbf{(3)}$$

```
> plot(rhs(SolucionParticular), t = 0..20)
```




```
> F_t := 20 sin(2 t)
```

$$F_t := 20 \sin(2\, t) \quad \textbf{(4)}$$

```
> EcuacionTemblor := lhs(EcuacionLibre) = F_t;
```

$$EcuacionTemblor := \frac{d^2}{dt^2} x(t) + 16\, x(t) = 20 \sin(2\, t) \quad \textbf{(5)}$$

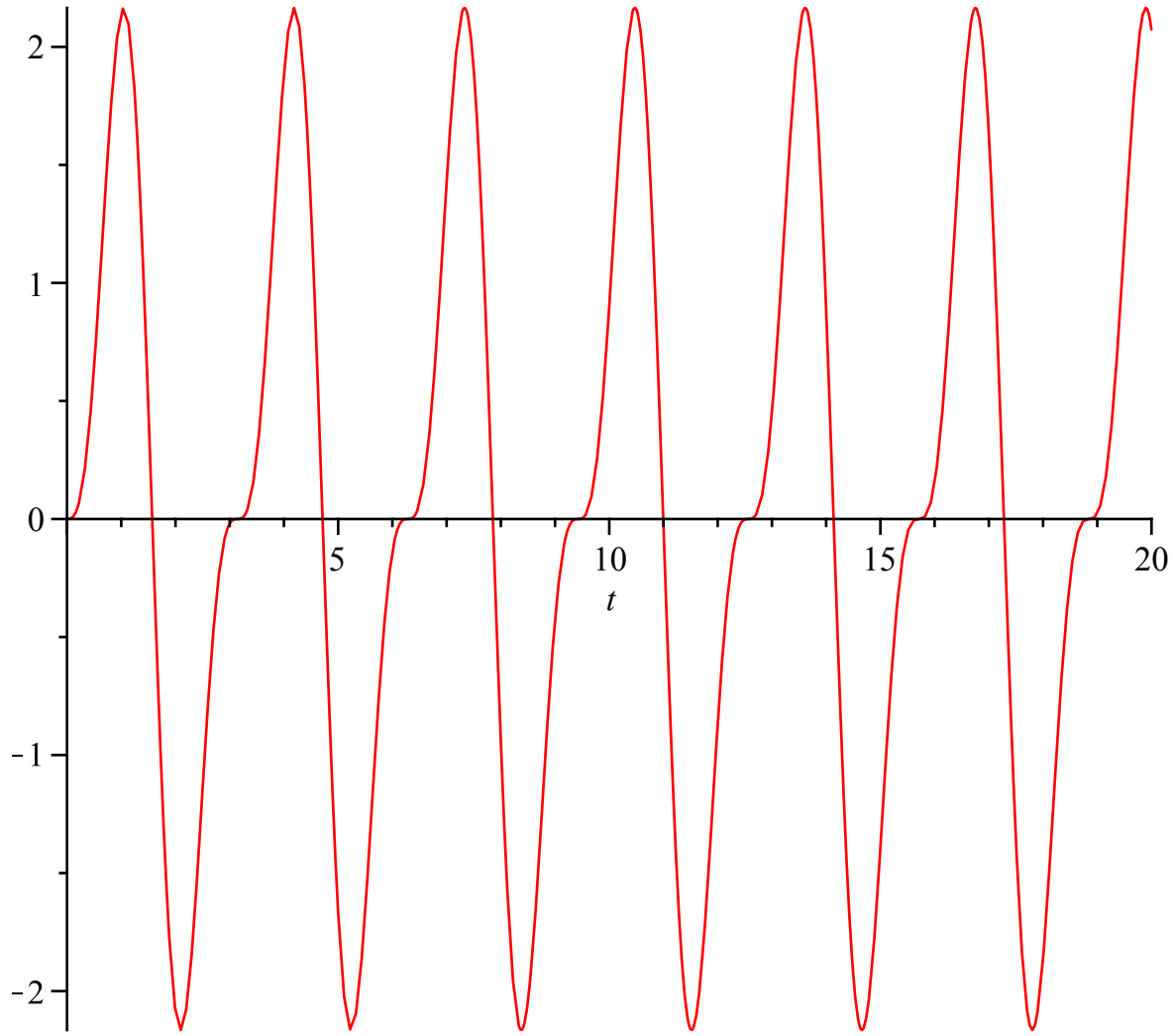
> $CondicionesTemblor := x(0) = 0, D(x)(0) = 0;$

$$CondicionesTemblor := x(0) = 0, D(x)(0) = 0 \quad (6)$$

> $SolucionTemblor := dsolve(\{EcuacionTemblor, CondicionesTemblor\})$

$$SolucionTemblor := x(t) = -\frac{5}{6}\sin(4t) + \frac{5}{3}\sin(2t) \quad (7)$$

> $plot(rhs(SolucionTemblor), t = 0..20)$



> $F_r := 20\sin(4t)$

$$F_r := 20\sin(4t) \quad (8)$$

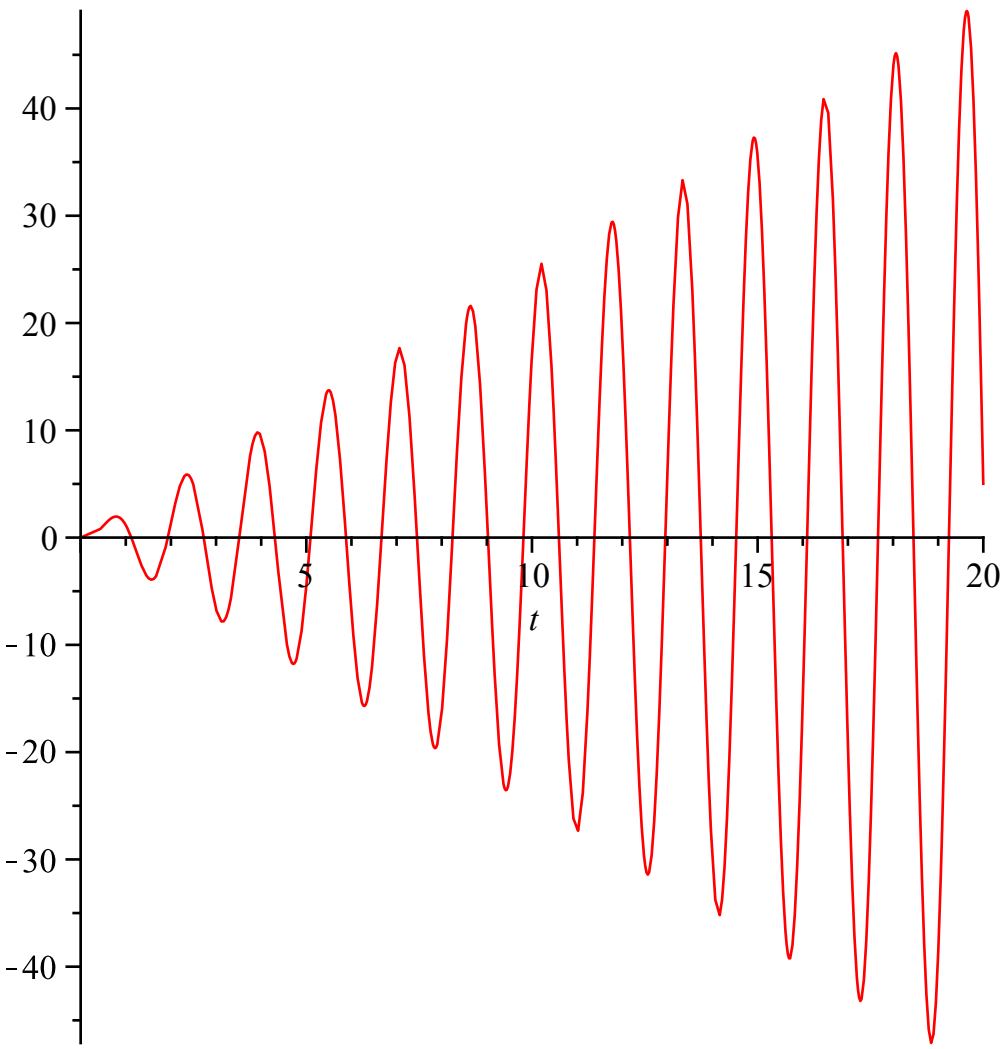
> $EcuacionResonancia := lhs(EcuacionLibre) = F_r$

$$EcuacionResonancia := \frac{d^2}{dt^2}x(t) + 16x(t) = 20\sin(4t) \quad (9)$$

> $SolucionResonancia := dsolve(\{EcuacionResonancia, CondicionesTemblor\})$

$$SolucionResonancia := x(t) = \frac{5}{8}\sin(4t) - \frac{5}{2}\cos(4t)\,t \quad (10)$$

> $plot(rhs(SolucionResonancia), t = 0..20)$


40
30
20
10
0
-10
-20
-30
-40
5
10
15
20
t