```
> restart
```

Problema MasaUno más ligera

```
> Sistema := diff(x1(t), t) = x3(t), diff(x2(t), t) = x4(t), diff(x3(t), t) = -((H1 + H2)/M1)·x1(t)
  + (H2/M1)·x2(t), diff(x4(t), t) = (H2/M2)·x1(t) - (H2/M2)·x2(t) : Sistema1; Sistema2; Sistema3;
  Sistema4
```

$$\frac{d}{dt}x_1(t) = x_3(t)$$

$$\frac{d}{dt}x_2(t) = x_4(t)$$

$$\frac{d}{dt}x_3(t) = -\frac{(H_1 + H_2)\,x_1(t)}{M_1} + \frac{H_2\,x_2(t)}{M_1}$$

$$\frac{d}{dt}x_4(t) = \frac{H_2\,x_1(t)}{M_2} - \frac{H_2\,x_2(t)}{M_2} \qquad \textbf{(1)}$$

```
> M1 := 1; M2 := 3; H1 := 2; H2 := 1
```

$$M_1 := 1$$

$$M_2 := 3$$

$$H_1 := 2$$

$$H_2 := 1 \qquad \textbf{(2)}$$

```
> Condiciones := x1(0) = 1/10, x2(0) = 2/10, x3(0) = 0, x4(0) = 0
```

$$Condiciones := x_1(0) = \frac{1}{10}, x_2(0) = \frac{1}{5}, x_3(0) = 0, x_4(0) = 0 \qquad \textbf{(3)}$$

```
> SolucionParticular := dsolve({Sistema, Condiciones}) : evalf(SolucionParticular1, 2);
  evalf(SolucionParticular2, 2); evalf(SolucionParticular3, 2); evalf(SolucionParticular4,
  2);
```

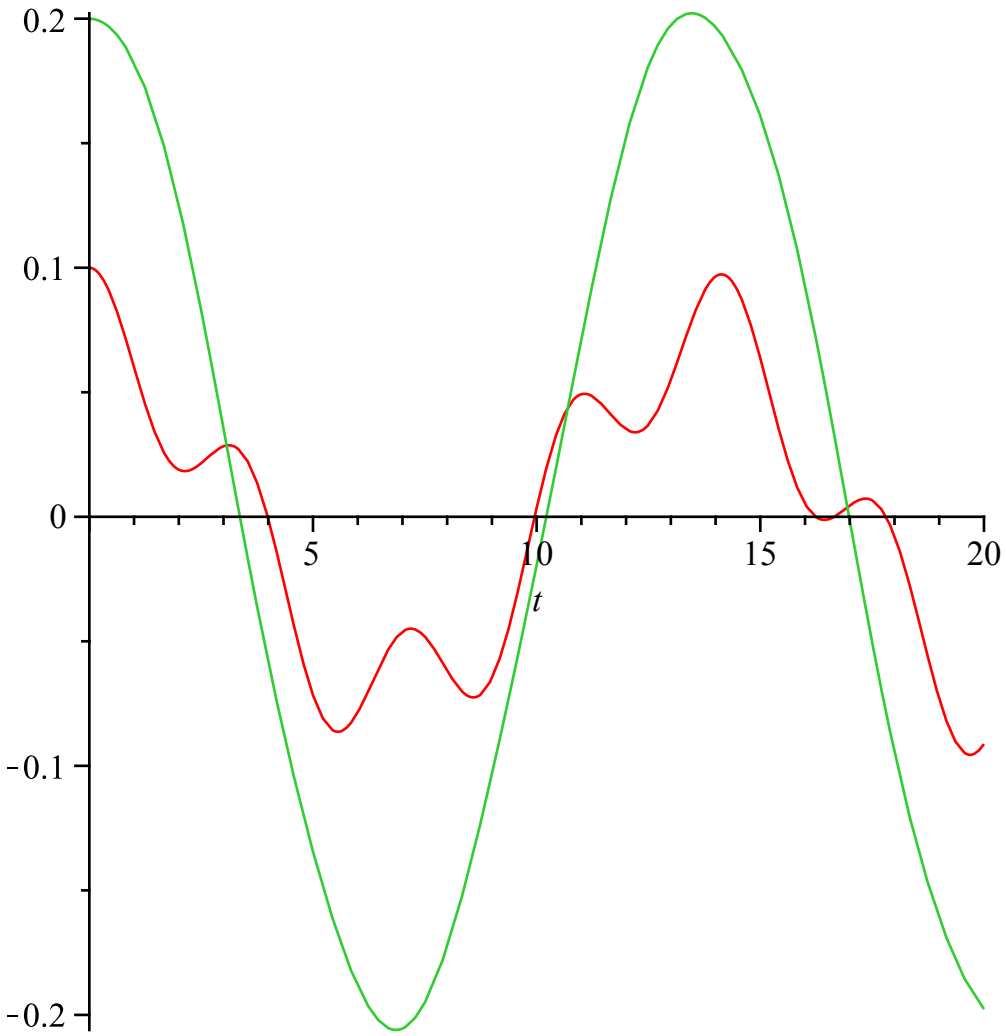
$$x_1(t) = 0.076\cos(0.46\,t) + 0.04\cos(1.7\,t)$$

$$x_2(t) = 0.21\cos(0.46\,t)$$

$$x_3(t) = -0.035\sin(0.46\,t) - 0.049\sin(1.7\,t)$$

$$x_4(t) = -0.098\sin(0.46\,t) + 0.002\sin(1.7\,t) \qquad \textbf{(4)}$$

```
> plot([rhs(SolucionParticular1), rhs(SolucionParticular2)], t = 0..20)
```



>

> *restart*

Problema MasaUno más pesada

> $Sistema := diff(x_1(t), t) = x_3(t), diff(x_2(t), t) = x_4(t), diff(x_3(t), t) = -\frac{(H_1 + H_2)}{M_1} \cdot x_1(t) + \left(\frac{H_2}{M_1}\right) \cdot x_2(t), diff(x_4(t), t) = \frac{H_2}{M_2} \cdot x_1(t) - \frac{H_2}{M_2} \cdot x_2(t) : Sistema_1; Sistema_2; Sistema_3; Sistema_4$

$$\frac{d}{dt} x_1(t) = x_3(t)$$

$$\frac{d}{dt} x_2(t) = x_4(t)$$

$$\frac{d}{dt} x_3(t) = -\frac{(H_1 + H_2)\, x_1(t)}{M_1} + \frac{H_2\, x_2(t)}{M_1}$$

$$\frac{d}{dt} x_4(t) = \frac{H_2\, x_1(t)}{M_2} - \frac{H_2\, x_2(t)}{M_2}$$

(5)

> $M_1 := 3; M_2 := 1; H_1 := 2; H_2 := 1$

$$M_1 := 3$$
$$M_2 := 1$$
$$H_1 := 2$$
$$H_2 := 1 \quad \textbf{(6)}$$

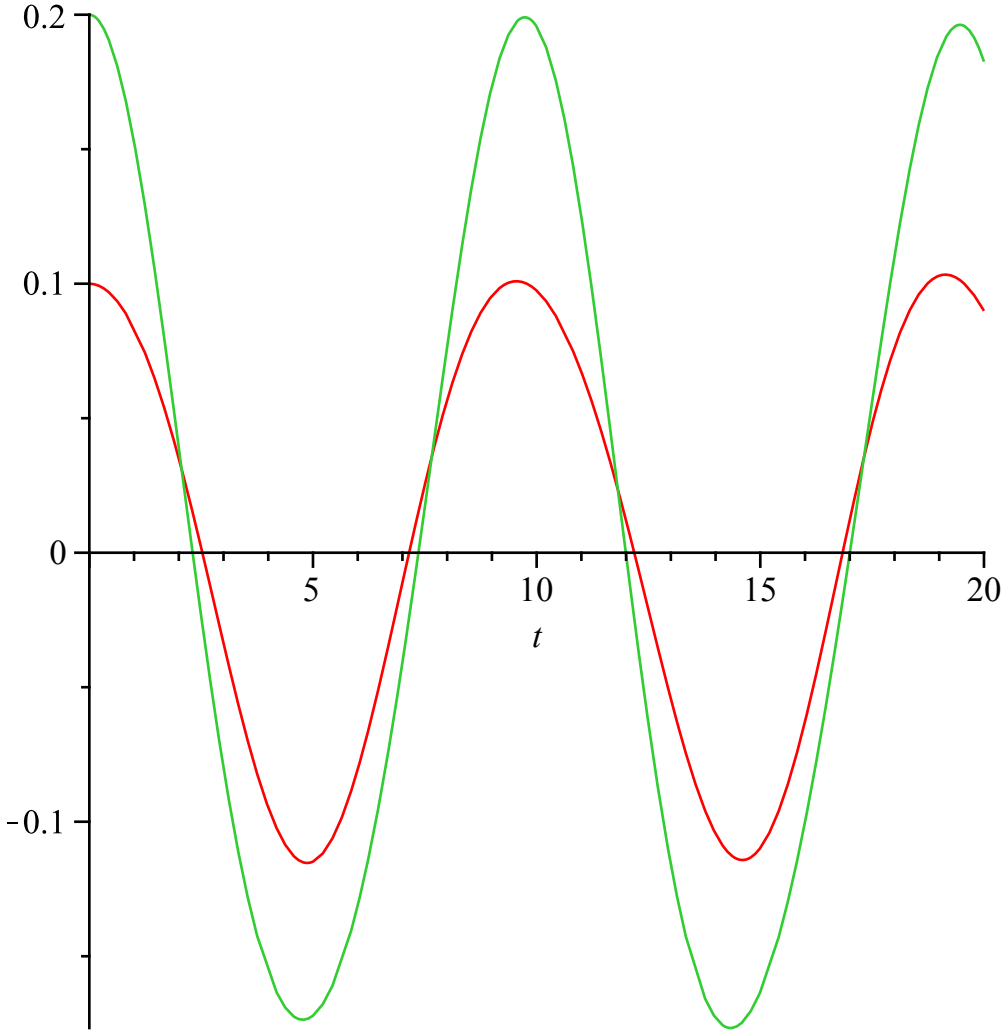
> $Condiciones := x_1(0) = \frac{1}{10}, x_2(0) = \frac{2}{10}, x_3(0) = 0, x_4(0) = 0$

$$Condiciones := x_1(0) = \frac{1}{10}, x_2(0) = \frac{1}{5}, x_3(0) = 0, x_4(0) = 0 \quad \textbf{(7)}$$

> $SolucionParticular := dsolve(\{Sistema, Condiciones\}) : evalf(SolucionParticular_1, 2); evalf(SolucionParticular_2, 2); evalf(SolucionParticular_3, 2); evalf(SolucionParticular_4, 2);$

$$x_1(t) = 0.097\cos(0.66\,t) - 0.008\cos(1.2\,t)$$
$$x_2(t) = 0.18\cos(0.66\,t) + 0.012\cos(1.2\,t)$$
$$x_3(t) = -0.066\sin(0.66\,t) + 0.0089\sin(1.2\,t)$$
$$x_4(t) = -0.12\sin(0.66\,t) - 0.016\sin(1.2\,t) \quad \textbf{(8)}$$

> $plot([rhs(SolucionParticular_1), rhs(SolucionParticular_2)], t = 0..20)$


0.2
0.1
0
-0.1
5
10
15
20
t