Inductor RL.

En el domimi del temps tenim.

Creat amb Jupyter amb Maxima Kernel. File - Save and Export Notebook as ...

In [1]:
```
eVs:Vs(t)=Vrs(t)+Vl(t);
eVl:Vl(t)=L*diff(i(t),t);
eVs2:eVs,eVl;
eVrs:Vrs(t)=Rs*i(t);
eVs2:eVs2,eVrs;
```

Out[1]:

$$\mathrm{Vs}\left(t\right) = \mathrm{Vrs}\left(t\right) + \mathrm{Vl}\left(t\right) \qquad (\%o_0)$$

Out[1]:

$$\mathrm{Vl}\left(t\right) = \mathrm{L}\,\left(\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right)\right) \qquad (\%o_1)$$

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$$\mathrm{Vs}\left(t\right) = \mathrm{L}\,\left(\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right)\right) + \mathrm{Vrs}\left(t\right) \qquad (\%o_2)$$

Out[1]:

$$\mathrm{Vrs}\left(t\right) = \mathrm{Rs}\,\mathrm{i}\left(t\right) \qquad (\%o_3)$$

Out[1]:

$$\mathrm{Vs}\left(t\right) = \mathrm{L}\,\left(\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right)\right) + \mathrm{Rs}\,\mathrm{i}\left(t\right) \qquad (\%o_4)$$

In [2]:
```
eI:solve(eVs2,diff(i(t),t));
```

Out[2]:

$$\left[\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right) = -\left(\frac{\mathrm{Rs}\,\mathrm{i}\left(t\right) - \mathrm{Vs}\left(t\right)}{\mathrm{L}}\right)\right] \qquad (\%o_5)$$

In [3]:
```
edI:diff(i(t),t)=(i(t)-i(t-dt))/dt;
eI2:eI,dI;
eI2:solve(eI2,i(t));
```

Out[3]:

$$\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right) = \frac{\mathrm{i}\left(t\right) - \mathrm{i}\left(t - \mathrm{dt}\right)}{\mathrm{dt}} \qquad (\%o_6)$$

Out[3]:

$$\left[\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right) = -\left(\frac{\mathrm{Rs}\,\mathrm{i}\left(t\right) - \mathrm{Vs}\left(t\right)}{\mathrm{L}}\right)\right] \qquad (\%o_7)$$

Out[3]:

$$\left[\mathrm{i}\left(t\right) = -\left(\frac{\mathrm{L}\,\left(\frac{\mathrm{d}}{\mathrm{d}\,t}\,\mathrm{i}\left(t\right)\right) - \mathrm{Vs}\left(t\right)}{\mathrm{Rs}}\right)\right] \qquad (\%o_8)$$

En el domini de la frequència tenim.

In [4]:
```
eIs:s*i(s)=(Vs(s)-Rs*i(s))/L;
eIs2:solve(eIs,i(s));
```

Out[4]:

$$s\,i(s) = \frac{Vs(s) - Rs\,i(s)}{L} \qquad (\%o_9)$$

Out[4]:

$$[i(s) = \frac{Vs(s)}{L\,s + Rs}] \qquad (\%o_{10})$$

Model Geomètric.

In [5]:
```
egVl0:Vl(t)=N*diff(Phi(t),t);
ePhi:diff(Phi(t),t)=diff(Am*B(t),t);
egVl1:egVl0,ePhi$
eB:diff(B(t),t)=diff(mu*H(t),t);
egVl2:egVl1,eB$
eH:diff(H(t),t)=diff(N*i(t)/Lm,t);
egVl:egVl2,eH;

eL:eVl,egVl;
eL:solve(eL,L);
```

Out[5]:

$$Vl(t) = N\,(\frac{d}{d\,t}\,\Phi(t)) \qquad (\%o_{11})$$

Out[5]:

$$\frac{d}{d\,t}\,\Phi(t) = Am\,(\frac{d}{d\,t}\,B(t)) \qquad (\%o_{12})$$

Out[5]:

$$\frac{d}{d\,t}\,B(t) = \mu\,(\frac{d}{d\,t}\,H(t)) \qquad (\%o_{14})$$

Out[5]:

$$\frac{d}{d\,t}\,H(t) = \frac{N\,(\frac{d}{d\,t}\,i(t))}{Lm} \qquad (\%o_{16})$$

Out[5]:

$$Vl(t) = \frac{Am\,N^2\,\mu\,(\frac{d}{d\,t}\,i(t))}{Lm} \qquad (\%o_{17})$$

Out[5]:

$$\frac{Am\,N^2\,\mu\,(\frac{d}{d\,t}\,i(t))}{Lm} = L\,(\frac{d}{d\,t}\,i(t)) \qquad (\%o_{18})$$

Out[5]:

$$[L = \frac{Am\,N^2\,\mu}{Lm}] \qquad (\%o_{19})$$