```
(%i1) w:2*%pi*50;
      R:12;
      L:22*10^-3;
      z:sqrt(R^2+(w*L)^2),numer;
      b:atan(L*w/R);
      Vm:230*sqrt(2);
      E:180;
      a:30*(%pi/180);
      V(t):=Vm*sin(w*t+a);
      C1:((Vm/L*1/((R/L)^2+w^2))*(w*cos(a)-(R/L)*sin(a))+E/R),numer;
      C2:(Vm/L*1/((R/L)^2+w^2)*((R/L)*sin(a)-w*cos(a))),numer;
      C3:(Vm/L*1/((R/L)^2+w^2)*((R/L)*cos(a)+w*sin(a))),numer;
      C4:(E/R)-Vm/z*sin(a-b),numer;
```

(%o1) $100\,\pi$

(%o2) 12

(%o3) $\frac{11}{500}$

(%o4) 13.84806431604333

(%o5) $\operatorname{atan}\left(\frac{11\,\pi}{60}\right)$

(%o6) $115\,2^{\frac{3}{2}}$

(%o7) 180

(%o8) $\frac{\pi}{6}$

(%o9) $\mathrm{V}\left(t\right) := Vm\sin\left(w\,t+a\right)$

(%o10) 14.97547008795629

(%o11) 0.024529912043714

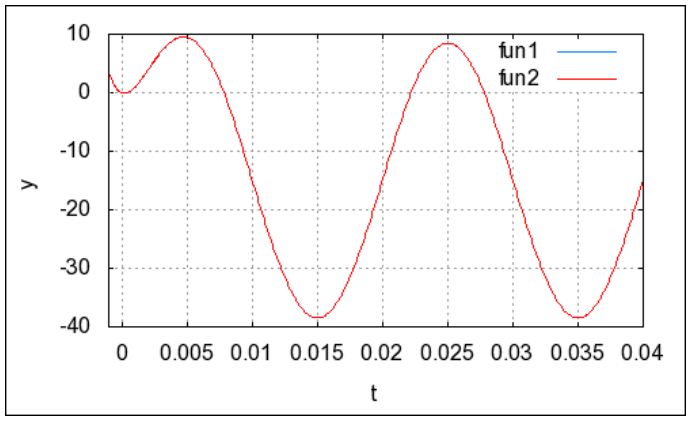
(%o12) 23.48840491677491

(%o13) 14.97547008795629

```
(%i14) i1(t):=C1*%e^(-R/L*t)+C2*cos(w*t)+C3*sin(w*t)-(E/R);
       i2(t):=C4*%e^(-R/L*t)+Vm/z*sin(w*t+a-b)-(E/R);
       wxplot2d([i1(t),i2(t)],[t,-0.001,0.04],[y,-40,10],[gnuplot_preamble, "set grid"]);
```

(%o14) $\mathrm{i1}\left(t\right) := C1\,e^{\frac{-R}{L}\,t}+C2\cos\left(w\,t\right)+C3\sin\left(w\,t\right)-\frac{E}{R}$

(%o15) $\mathrm{i2}\left(t\right) := C4\,e^{\frac{-R}{L}\,t}+\frac{Vm}{z}\sin\left(w\,t+a-b\right)-\frac{E}{R}$



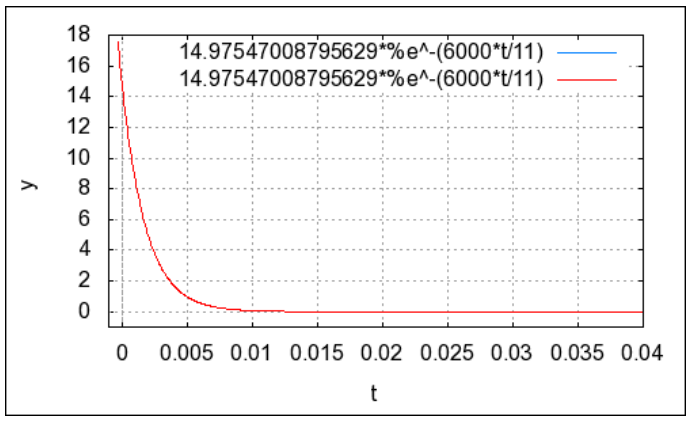
(%t16)

(%o16)

```
(%i17) i1(t):=C1*%e^(-R/L*t);
       i2(t):=C4*%e^(-R/L*t);
       wxplot2d([i1(t),i2(t)],[t,-0.001,0.04],[y,-1,18],[gnuplot_preamble, "set grid"]);
```

(%o17) $\mathrm{i1}\,(t) := C1\,e^{\frac{-R}{L}\,t}$

(%o18) $\mathrm{i2}\,(t) := C4\,e^{\frac{-R}{L}\,t}plot2d : somevalueswereclipped.plot2d : somevalueswereclipped.$



(%t19)

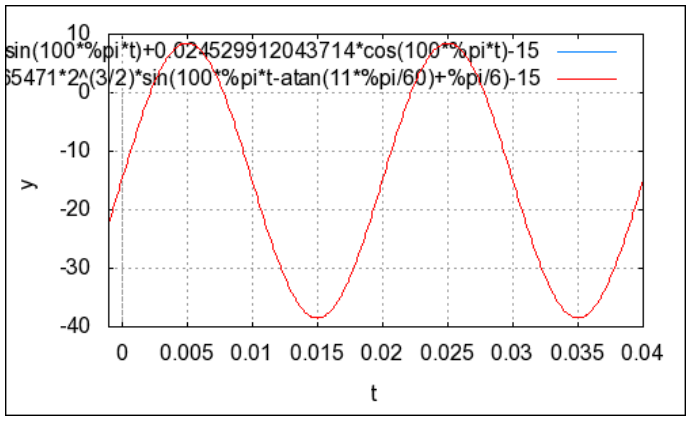
(%o19)

```
(%i20) i1(t):=C2*cos(w*t)+C3*sin(w*t)-(E/R);
       i2(t):=Vm/z*sin(w*t+a-b)-(E/R);
       wxplot2d([i1(t),i2(t)],[t,-0.001,0.04],[y,-40,10],[gnuplot_preamble, "set grid"]);
```

(%o20) $\mathrm{i1}\,(t) := C2\cos(w\,t) + C3\sin(w\,t) - \dfrac{E}{R}$

(%o21) $\mathrm{i2}\,(t) := \dfrac{Vm}{z}\sin(w\,t + a - b) - \dfrac{E}{R}$

(%t22)


sin(100*%pi*t)+0.024529912043714*cos(100*%pi*t)-15
65471*2^(3/2)*sin(100*%pi*t-atan(11*%pi/60)+%pi/6)-15
10
0
-10
-20
-30
-40
y
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
t

(%o22)