In [3]:
```
from sympy import *
```

Example 1: m =2 , k = 30, gamma=0.6 ; u(0)=.05 ; u'(0)=.10

In [4]:
```
t=symbols('t')
u=Function('u')
m=2
gamma=0.6
k=30
g=0
deq=m*diff(u(t),t,2)+gamma*diff(u(t),t)+k*u(t)-g
usoln=dsolve(deq,u(t),ics={u(0):0.05,diff(u(t),t).subs(t,0):0.10})
print('The solution is',usoln)
```

```
The solution is Eq(u(t), (0.0277772213820646*sin(3.87007751860347*t) + 0.05
*cos(3.87007751860347*t))*exp(-0.15*t))
```

m=1/4, gamma=1/4, k=16, g=4cos(2t), u(0)=1/6, u'(0)=0

In [5]:
```
t=symbols('t')
u=Function('u')
m=1/4
gamma=1/4
k=16
g=4*cos(2*t)
deq=m*diff(u(t),t,2)+gamma*diff(u(t),t)+k*u(t)-g
usoln=dsolve(deq,u(t),ics={u(0):1/6,diff(u(t),t).subs(t,0):0})
print('The solution is',usoln)
```

```
The solution is Eq(u(t), (-0.00846781274108847*sin(7.98435971133566*t) - 0.
0997040325564183*cos(7.98435971133566*t))*exp(-0.5*t) + 0.00887902330743618
*sin(2*t) + 0.266370699223085*cos(2*t))
```

In [ ]:
```

```