```
ln[1] := (*omega := 10.0;*)
         (*m := 4.0;*)
         (*epsilon := 0.5;*)
         (*amp = 18.0*)
         f[x_] := -amp * Sin[omega * x] - m * x
         oldf[x_] := -4 * x
 \ln |3| = v[x] := \text{Integrate}[-f[t]*(-t), \{t, 0, x\}] + \text{Integrate}[-f[t]*(-x), \{t, x, 1\}];
         Simplify[v[x]]
         m omega^2 x \left(-3+x^2\right)+6 amp omega x Cos[omega] - 6 amp Sin[omega x]
 Out[4]=
 ln[5]:= u[x_] := v[x] + epsilon * x + 1
 In[6]:= Simplify[u[x]]
 \text{Out[6]= 1 + epsilon } x - \frac{\text{m } x}{2} + \frac{\text{m } x^3}{6} + \frac{\text{amp } x \text{ Cos[omega]}}{\text{omega}} - \frac{\text{amp } \text{Sin[omega } x]}{\text{omega}^2}
 In[7]:= Simplify[D[u[x], x]]
 \text{Out[7]=} \quad \text{epsilon} \; - \; \frac{\text{m}}{2} \; + \; \frac{\text{m} \; \text{x}^{\; 2}}{2} \; + \; \frac{\text{amp Cos[omega]}}{\text{omega}} \; - \; \frac{\text{amp Cos[omega x]}}{\text{omega}} \; - \; \frac{\text{amp Cos[omega x]}}{\text{omega}}
 ln[8]:= v[0] // N
        D[v[x], x] /. x \rightarrow 1 // N
         Simplify [D[D[v[x], x], x] + f[x]]
 Out[8]= 0.
                                               0.5 (2. m omega + 2. amp omega Sin [omega])
 Out[9]= -1. m - 1. amp Sin[omega] + -
                                                                         omega
Out[10]= 0
ln[11] = u[0]
        D[u[x], x] /.x \rightarrow 1
         Simplify [D[D[u[x], x], x] + f[x]]
Out[11]= 1
Out[12]= epsilon - m - amp Sin [omega] + 2 m omega + 2 amp omega Sin [omega]
                                                                       2 omega
Out[13]= 0
```