```
(*v=dψ/dt*)
```

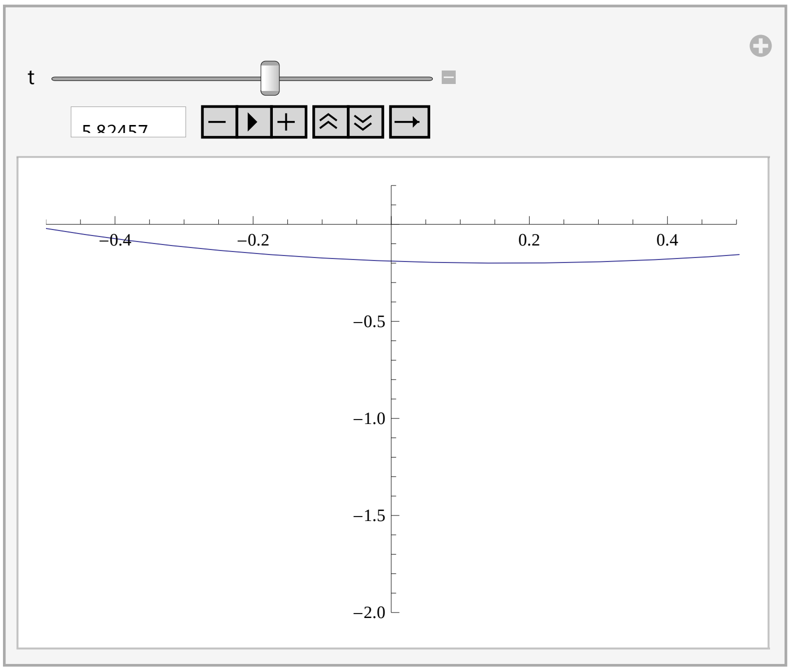
In[1]:=
```
DSolve[f''[y] - k^2 * f[y] == 0, f[y], y]
```

Out[1]=
$$\{\{f[y] \to e^{k y} C[1] + e^{-k y} C[2]\}\}$$

In[62]:=
```
k[L_] := π / L;
ψx[A_, x_, y_, t_, f_, h_, L_] :=
  A * Cos[2 * π * f * t] * Cos[k[L] * x] * (Exp[k[L] * y] + Exp[-2 * k[L] * h] * Exp[-k[L] * y]);
ψy[A_, x_, y_, t_, f_, h_, L_] := A * Cos[2 * π * f * t] * Sin[k[L] * x] *
   (Exp[k[L] * y] - Exp[-2 * k[L] * h] * Exp[-k[L] * y]);

y0 = 0;
L = 1;
h = 2;
f = 0.1;
A = h / 10;
```

In[70]:=
```
Manipulate[
 ListPlot[
  Table[
   {x + ψx[A, x, y0, t, f, h, L], y0 + ψy[A, x, y0, t, f, h, L]},
   {x, -L / 2, L / 2, L / 20}
  ],
  Joined → True, PlotRange → {{-L / 2, L / 2}, {-h, A}}
 ],
 {t, 0, 10}
]
```



ListPlot::prng : Value of option PlotRange −> $\left\{\left\{-\frac{L}{2}, \frac{L}{2}\right\}, \{-h, A\}\right\}$ is not All,

Full, Automatic, a positive machine number, or an appropriate list of range specifications. ≫

ListPlot::prng : Value of option PlotRange −> $\left\{\left\{-\frac{L}{2}, \frac{L}{2}\right\}, \{-h, A\}\right\}$ is not All,

Full, Automatic, a positive machine number, or an appropriate list of range specifications. ≫

ListPlot::prng : Value of option PlotRange −> $\left\{\left\{-\frac{L}{2}, \frac{L}{2}\right\}, \{-h, A\}\right\}$ is not All,

Full, Automatic, a positive machine number, or an appropriate list of range specifications. ≫

ListPlot::prng : Value of option PlotRange −> $\left\{\left\{-\frac{L}{2}, \frac{L}{2}\right\}, \{-h, A\}\right\}$ is not All,

Full, Automatic, a positive machine number, or an appropriate list of range specifications. ≫

ListPlot::prng : Value of option PlotRange −> $\left\{\left\{-\frac{L}{2}, \frac{L}{2}\right\}, \{-h, A\}\right\}$ is not All,

Full, Automatic, a positive machine number, or an appropriate list of range specifications. ≫

ListPlot::prng : Value of option PlotRange −> $\left\{\left\{-\frac{L}{2}, \frac{L}{2}\right\}, \{-h, A\}\right\}$ is not All,

Full, Automatic, a positive machine number, or an appropriate list of range specifications. ≫

In[24]:=
```
Clear["Global`*"]
k[L_] := π / L;
ψx[A_, x_, y_, t_, f_, h_, L_] :=
  A * Sin[2 * π * f * t - k[L] * x] * (Exp[k[L] * y] + Exp[-2 * k[L] * h] * Exp[-k[L] * y]);
ψy[A_, x_, y_, t_, f_, h_, L_] := A * Cos[2 * π * f * t - k[L] * x] *
   (Exp[k[L] * y] - Exp[-2 * k[L] * h] * Exp[-k[L] * y]);

y0 = 0;
L = 1;
h = 2;
f = 0.1;
A = h / 10;
```

In[34]:=
```
Manipulate[
 ListPlot[
  Table[
   {x + ψx[A, x, y0, t, f, h, L], y0 + ψy[A, x, y0, t, f, h, L]},
   {x, -L / 2, L / 2, L / 20}
  ],
  Joined → True, PlotRange → {{-L / 2, L / 2}, {-h, A}}
 ],
 {t, 0, 10}
]
```

Out[34]=