In[1]:=
$$\text{create}[f\_] := \frac{1}{\text{Sqrt}[2\,\text{hbar}\,m\,w]}\,(-\text{hbar}\,D[f,\,x] + m\,w\,x\,f)$$

In[2]:=
$$\text{phi0} := \left(m\,\frac{w}{\text{Pi}\,\text{hbar}}\right)\text{^}(1/4)\,\text{Exp}\left[-m\,\frac{w}{2\,\text{hbar}}\,x\text{^}2\right]$$

In[4]:=
$$\text{hbar} = m = w = 1$$

Out[4]=
$$1$$

In[5]:=
$$\text{phin}[n\_] := \frac{1}{\text{Sqrt}[n!]}\,\text{Nest}[\text{create},\,\text{phi0},\,n]$$

In[7]:=
$$\text{Show}\left[\text{Plot}\left[\text{Evaluate}\left[\text{Table}\left[\text{phin}[n] + \left(n + \frac{1}{2}\right)\text{hbar}\,w,\,\{n,\,0,\,10,\,1\}\right]\right],\,\{x,\,-5,\,5\}\right],\right.$$
$$\left.\text{Plot}[1/2\,m\,w\text{^}2\,x\text{^}2,\,\{x,\,-5,\,5\}\,,\,\text{PlotStyle} \to \text{Dashed},\,\text{ColorFunction} \to \text{GrayLevel}]\right]$$

Out[7]=