In[6]:=
```
sol = DSolve[x'[t] == x[t], x[t], t]
```
Out[6]= $\{\{x[t] \to e^t c_1\}\}$

In[7]:=
```
D[x[t], t] == x[t] /. sol[[1]]
```
Out[7]= $x'[t] == e^t c_1$

In[8]:=
```
x[t] /. First[DSolve[{x'[t] == x[t] , x[0] == 2}, x[t], t]]
```
Out[8]= $2\, e^t$

In[9]:=
```
DSolve[y'[x] + y[x] * Tan[x] == Sin[2 * x], y[x], x]
```
Out[9]= $\{\{y[x] \to c_1 \text{Cos}[x] - 2 \text{Cos}[x]^2\}\}$

In[11]:=
```
DSolve[{y'[x] + y[x] * Tan[x] == Sin[2 * x], y[0] == 0}, y, x]
```
Out[11]= $\{\{y \to \text{Function}[\{x\}, -2 (-\text{Cos}[x] + \text{Cos}[x]^2)]\}\}$

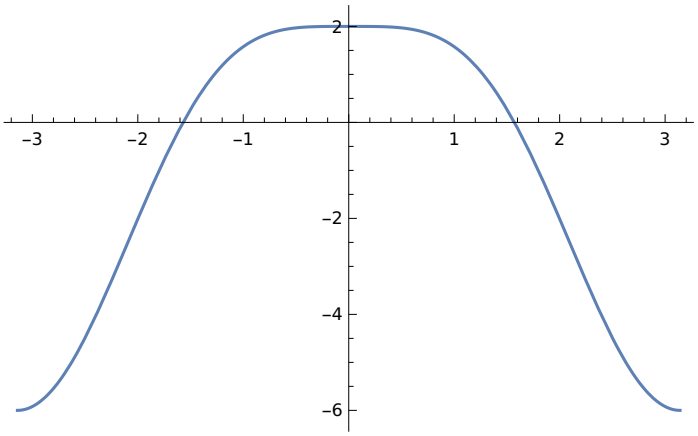
In[14]:=
```
soll = DSolve[x''[t] == -ω^2 x[t], x, t]
```
Out[14]= $\{\{x \to \text{Function}[\{t\}, c_1 \text{Cos}[t\, \omega] + c_2 \text{Sin}[t\, \omega]]\}\}$

In[18]:=
```
{{x → Function[{t}, c1 Cos[t ω] + c2 Sin[t ω]]}}
```
Out[18]= $\{\{x \to \text{Function}[\{t\}, c_1 \text{Cos}[t\, \omega] + c_2 \text{Sin}[t\, \omega]]\}\}$

In[26]:=
```
sol = DSolve[{y'[x] + y[x] * Tan[x] == Sin[2 * x], y[0] == 2}, y[x], x]
sol[[1]]
```
Out[26]= $\{\{y[x] \to -2 (-2 \text{Cos}[x] + \text{Cos}[x]^2)\}\}$

Out[27]= $\{y[x] \to -2 (-2 \text{Cos}[x] + \text{Cos}[x]^2)\}$

In[29]:=
```
Plot[y[x] /. sol[[1]], {x, -π, π}]
```
Out[29]=



In[34]:=
```
s = DSolve[{3 * y''[x] + 5 * y'[x] + 6 * y[x] == 0, y[0] == 0, y'[0] == 1}, y[x], x]
z[x_, a_, b_, c_] = y[x] /. s[[1]]
```

Out[34]=
$$\left\{\left\{y[x] \to \frac{6\, e^{-5\,x/6}\, \text{Sin}\left[\frac{\sqrt{47}\,x}{6}\right]}{\sqrt{47}}\right\}\right\}$$

Out[35]=
$$\frac{6\, e^{-5\,x/6}\, \text{Sin}\left[\frac{\sqrt{47}\,x}{6}\right]}{\sqrt{47}}$$

In[38]:=
```
Plot[y[x] /. s[[1]], {x, 0, 5}]
```

Out[38]=