

In[1]:= **DSolve**[{y'[x] == Sin[5 * x]}, y[x], x]

Out[1]= $\left\{ \left\{ y[x] \rightarrow C[1] - \frac{1}{5} \cos[5 x] \right\} \right\}$

In[2]:= **DSolve**[{x^2 * y'[x] == y[x] - y[x] * x}, y[x], x]

Out[2]= $\left\{ \left\{ y[x] \rightarrow \frac{e^{-1/x} C[1]}{x} \right\} \right\}$

In[3]:= **DSolve**[{x^2 * y'[x] == y[x] - y[x] * x, y[1] == $\frac{1}{e}$ }, y[x], x]

Out[3]= $\left\{ \left\{ y[x] \rightarrow \frac{e^{-1/x}}{x} \right\} \right\}$

In[4]:= **DSolve**[{y''[x] + 5 y'[x] + 2 y[x] == 0, y[0] == 5, y'[0] == 10}, y[x], x]

Out[4]= $\left\{ \left\{ y[x] \rightarrow -\frac{5}{34} \left(-17 e^{\left(-\frac{5}{2} - \frac{\sqrt{17}}{2}\right)x} + 9 \sqrt{17} e^{\left(-\frac{5}{2} - \frac{\sqrt{17}}{2}\right)x} - 17 e^{\left(-\frac{5}{2} + \frac{\sqrt{17}}{2}\right)x} - 9 \sqrt{17} e^{\left(-\frac{5}{2} + \frac{\sqrt{17}}{2}\right)x} \right) \right\} \right\}$

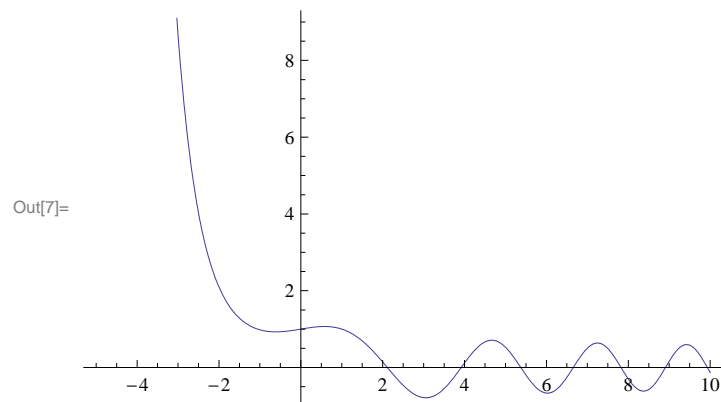
In[5]:= **DSolve**[{y''[x] + 5 y'[x] + 2 y[x] == 0}, y[x], x]

Out[5]= $\left\{ \left\{ y[x] \rightarrow e^{\left(-\frac{5}{2} - \frac{\sqrt{17}}{2}\right)x} C[1] + e^{\left(-\frac{5}{2} + \frac{\sqrt{17}}{2}\right)x} C[2] \right\} \right\}$

In[6]:= **a = NDSolve**[{y''[x] + x * y[x] == 0, y[0] == 1, y[1] == 1}, y[x], {x, -5, 10}]

Out[6]= $\{ \{ y[x] \rightarrow \text{InterpolatingFunction}[\{ \{-5., 10.\} \}, <>][x] \} \}$

In[7]:= **Plot**[Evaluate[y[x] /. a], {x, -5, 10}]



NDSolve::deqn : Equation or list of equations expected

instead of 1 in the first argument $\{y[t] + y'[t](1 + y'[t])^2 + y''[t] == 0, 1, y'[0] == 0\}$. >>

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In[10]:= b = NDSolve[{y''[t] + (y'[t] + 1)^2 * y'[t] + y[t] == 0, y[0] == 1, y'[0] == 0}, y[t], {t, 0, 10}]
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```
Out[10]= NDSolve[{y'[t] + y'[t] (1 + y'[t])^2 + y''[t] == 0, 1, y'[0] == 0}, y[t], {t, 0, 10}]
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