Second Order Homogeneous Equations

In this worksheet, you will solve several second order linear constant coefficient homogeneous differential equations.

1. Solve the initial value problem:

\[
\begin{align*}
3y'' - 12y' + 9y &= 0 \\
y(0) &= 0 \\
y'(0) &= 1
\end{align*}
\]
Solve the initial value problem:
\[
\begin{aligned}
y'' - 2y' + y &= 0 \\
y(0) &= a \\
y'(0) &= b
\end{aligned}
\]
Solve the boundary value problem:

\[
\begin{align*}
  y'' + 4y &= 0 \\
  y(0) &= 0 \\
  y\left(\frac{\pi}{4}\right) &= 3
\end{align*}
\]
Solve the boundary value problem:
\[
\begin{aligned}
    y'' + 4y &= 0 \\
    y(0) &= 0 \\
    y\left(\frac{\pi}{2}\right) &= 3
\end{aligned}
\]