Sections 6.1–6.3

Find the Laplace Transform of $f(t) = t$.

Find $\mathcal{L}\{f'(s)\}$. Find $\mathcal{L}\{f''(s)\}$. 
Sections 6.1–6.3
Given $\mathcal{L}\{\sin at\}(s) = \frac{a}{s^2 + a^2}$, find $\mathcal{L}\{\cos at\}(s)$.  

\textbf{Sections 6.1–6.3}
Sections 6.1–6.3

Solve

\[ x'' - 2x' + 2x = 0, \quad x(0) = 0, x'(0) = 1 \]
Sections 6.1–6.3
Solve

\[ x'' - 4x' + 4x = 0, \quad x(0) = 1, x'(0) = 1 \]
Sections 6.1–6.3
Sections 6.1–6.3

Solve

\[ x'' + 2x' + 5x = 0, \quad x(0) = 2, x'(0) = -1 \]
Sections 6.1–6.3
The unit step function is

Sketch the graph of $h(t) = u_\pi(t) - u_{2\pi}(t)$.  

**Sections 6.1–6.3**
Sections 6.1–6.3
Let
\[ f(t) = \begin{cases} 
2 & 0 \leq t < 4 \\
5 & 4 \leq t < 7 \\
-1 & 7 \leq t < 9 \\
1 & 9 \leq t 
\end{cases} \]

Use unit step functions to write \( f \). Find the Laplace Transform of \( f \).
Sections 6.1–6.3
Find the inverse Laplace transform of:

\[ F(s) = \frac{e^{-2s}}{s^2 + s - 2}. \]
Sections 6.1–6.3
SECTIONS 6.1–6.3

Find the inverse Laplace transform of:

\[ F(s) = \frac{2e^{-2s}}{s^2 - 4}. \]
Sections 6.1–6.3
Sections 6.1–6.3

Using this, find the inverse Laplace transform of:

\[ G(s) = \frac{1}{s^2 - 4s + 5}. \]
Sections 6.1–6.3
Sections 6.1–6.3

Using this, find the inverse Laplace transform of:

\[ G(s) = \frac{s}{s^2 - 4s + 5}. \]
Sections 6.1–6.3
Find the solution to the IVP

\[ x'' - 4x' + 5x = 0, \quad x(0) = 1, \quad x'(0) = 4. \]
Sections 6.1–6.3
Sections 6.1–6.3
Sections 6.1–6.3