Complete solutions to the following problems from the course text will be posted in a glass case near the ECE Office. Numerical values of answers to many of these problems are listed in the back of the course text.

1.1. Text 8.1 and 8.2
1.2. Text 8.7, 8.8, and 8.46a,b.
1.3. Text 8.26 and 8.46c.
1.4. Write the first-order coupled differential equations for the circuit in Fig 1.4.1 in the form \( \frac{dx}{dt} = f(x, t) \) where \( x \) is the state vector and \( t \) is time.

![Third-order circuit](image)

**Answer:**
\[
\begin{align*}
\frac{di_1}{dt} &= \frac{v_1 - i_1 R_1}{L_1} \\
\frac{di_2}{dt} &= \frac{v_1 - i_2 R_2}{L_2} \\
\frac{dv_1}{dt} &= \frac{i_0 - (i_1 + i_2)}{C}
\end{align*}
\]

1.5. Evaluate the state vector \( x \) at \( t = 0^+ \) for the above circuit in terms of symbolic component names.

**Answer:**
\[
\begin{align*}
i_1(0^+) &= \frac{-i_0 R_2}{R_1 + R_2} \\
i_2(0^+) &= \frac{-i_0 R_1}{R_1 + R_2} \\
v_1(0^+) &= -i_0 \cdot \frac{1}{R_1 \parallel R_2}
\end{align*}
\]