First do the following Wiley-Plus assignment: Assignment #30c

After completing the Wiley-Plus, in your homework notebook, complete the following problems:
CH30 Questions # 7, 8, and 9.

CH30 Problems # 61 and 67.

To check your work, the answers to the odd problems are in the back of the book.

The answers to the even problems are: None were assigned this assignment.

Homework

Then complete the attached worksheets: (Note: the above problems were designed to ensure you have the skills to solve the worksheet problems. It is imperative to your learning of the problem solving technique to do the above problems BEFORE attempting the worksheet problems. You are graded on both! Homework notebooks are graded.)
CH-30-C-1:

For each of the equations below,

1) State what each term is in your own words ...
2) What the units of each term are...
3) What is the general use of that equation in your own words?

A. \( i = i_{\text{max}} \left( 1 - e^{-\frac{Rt}{L}} \right) \), include exactly how this is equivalent to what is on your equation sheet. Also include a graph of what this curve looks like.

B. \( i = i_0 \left( e^{-\frac{Rt}{L}} \right) \) Also include a graph of what this curve looks like.

C. \( U_B = \frac{1}{2} Li^2 \)

D. \( u_B = \frac{B^2}{2\mu_0} \)
CH-30-C-2:

Given the RL circuit shown below where, \( R = 6\Omega \) and \( L = 0.3\text{H} \); answer the follow parts of this question:

![RL Circuit Diagram]

a) There is no current in the circuit before the switch is closed at \( t=0 \). **What is the voltage across the resistor at \( t=0.03\text{s} \)?**

*Show all work*

b) When the current is 0.82A, **what is the energy stored in the inductor?**

*Show all work*
CH-30-C-3:

Figure below shows an RL circuit containing resistance $R = 200\,\Omega$, inductance $L = 800\,\mu\text{H}$, and an ideal battery with a potential difference of $V = 12\,\text{V}$. When the switch is closed at time $t = 0$, current begins to appear in the circuit.

a) What is the final (equilibrium) current (when changes have stopped)?

b) At what time is the current $i = 30\,\text{mA}$?

Show all work
CH-30-C-4:

Figure below shows a circuit containing a battery, resistor 1, resistor 2 \((R_2 = 200\, \Omega)\), and an inductor \((L = 800\, \mu H)\). Switch \(S\) has been closed a long time (so that equilibrium has been reached) and the current through the inductor is 20.0 mA. At time \(t = 0\), the switch is opened.

**a)** At what time \(t\) is the current through the inductor 10.0 mA (on its way down to zero)?

Show all work

**b)** What are the number of turns of this 4 cm long inductor (ideal solenoid) if the energy density is \(16 \times 10^{-8}\, \frac{J}{m^3}\) ?

Show all work