Homework 3 Fuel Cell

1.

Consider Figure 3.4. This was produced using equation 3.4. Using MATLAB, EXCELL or a similar mathematical program, reproduce this diagram for yourself.
(The simple script file on page 60 may help. The main problem will be the case where the current density is less than io , because at these currents equation 3.4 does not hold true.)

2.

In Section 3.5 the problem of internal currents and fuel crossover is addressed. After reading this, look ahead to page 126, the bottom half. Here a special case of this problem in alkaline fuel cells is mentioned. Here reported measurements of about1.5 mA.cm-2 are mentioned. If this is for a 30-cell stack, each cell of area 200 cm2, what is the rate of hydrogen use at open circuit?

3.

Check that the data in the right hand column of Table 3.3 does indeed give a graph like that of Figure 3.1.

4.

Use MATLAB or EXCELL to produce a graph like Figure 3.2. The simple script file on page 60 could be your starting point.