Physics 106  
Context Problem #5

CID: ______________

A network of resistors and batteries is shown below. Each battery has voltage $12$ V and an internal resistance of $2/3 \, \Omega$. Each resistor has a resistance of $2 \, \Omega$. Find all the currents using Kirchoff’s laws. Note that symmetry allows you to reduce the problem from one with 16 currents to one with 4 currents. The junction in the middle is useful to reduce the four currents to three currents. Then things work out pretty easily.