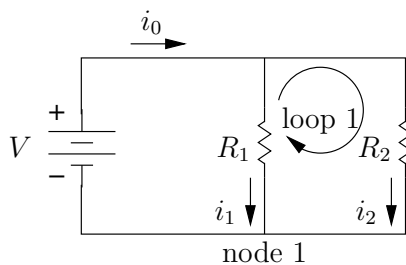


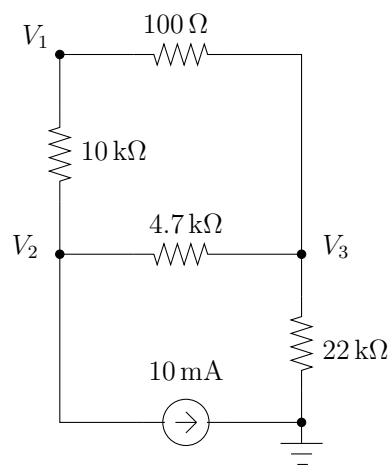
1. A mechanic drops a wrench across both terminals of a 12 V motorcycle battery. This puts 120 A through the wrench. *Assume all the resistance is inside the motorcycle battery ($R = 0$ for the wrench).*
 - (a) (*4 points*) What is the total resistance of the circuit?
 - (b) (*4 points*) How much power is dissipated?
 - (c) (*3 points*) What is the voltage across the wrench?
 - (d) (*6 points*) Find and draw Thevenin and Norton equivalents for the battery (without the wrench).

2. Consider the following circuit.



- (a) (4 points) Write KVL for loop 1.
- (b) (4 points) Write KCL for node 1.
- (c) (4 points) Combine the above to eliminate i_2 and solve for i_1 .¹

¹The result should be the familiar current divider formula.



3. (11 points) Set up, but do not solve, the equations for node voltage analysis of this circuit. The only unknowns should be V_1 , V_2 and V_3 .

4. (10 points) Find R_1 and R_2 .

