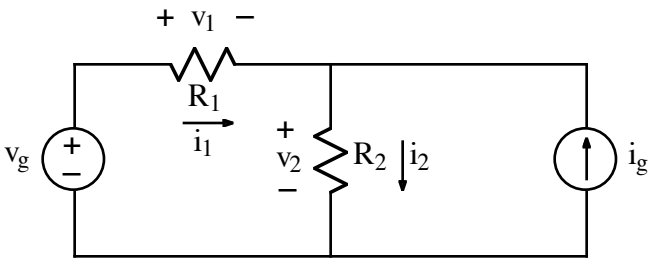
By: Carl H. Durney and Neil E. Cotter

EX: In the circuit below, use Kirchhoff's voltage and current laws to write equations relating voltages and currents.



ANSWER: $-i_1 + i_2 - i_g = 0$

$v_g - v_1 - v_2 = 0$

SOL'N: We sum the currents flowing out of the top center node. Writing an equation for the bottom node would be redundant. Recall that we always have one extra node.

Because writing a v-loop equation for the right inner loop would require defining a voltage for a current source, we write a v-loop equation for only the left loop. Note that the only larger loop containing the right inner loop would also require defining a voltage for the current source. Thus, a voltage loop equation for the right side is unnecessary.

Our voltage loop on the left starts from the lower left and proceeds in a clockwise direction. We may start voltage loops wherever we desire, but being consistent tends to improve accuracy.