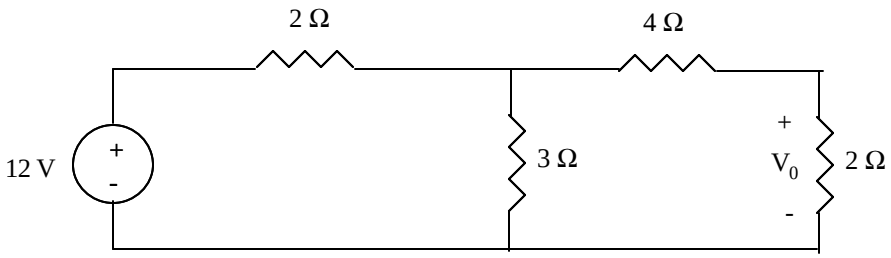
Quiz 2 INEL 4075

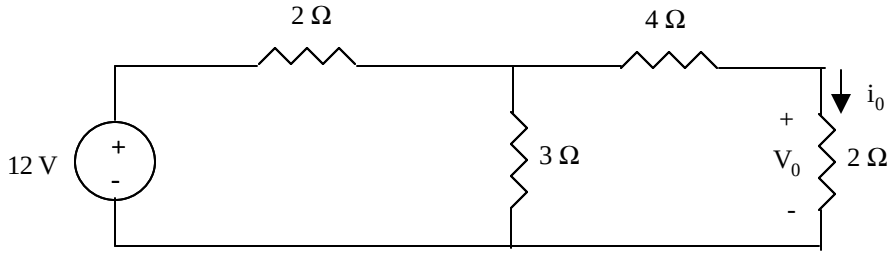
Name CLAVE March 5, 2002

Question 1 (10 points):
Find V_0 in the following circuit:

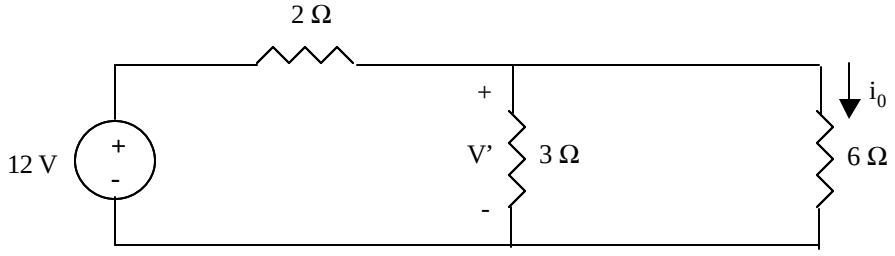


Solution:

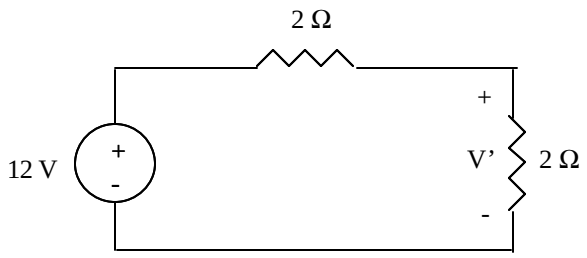
We can define i_0 in the direction marked in the diagram



By Ohm's Law: $V_0 = i_0(2\Omega)$. Now 4 ohms and 2 ohms are in series so its equivalent is 6 ohms. The current i_0 is still there.



Now 3 ohms are in parallel with 6 ohms. So $R_{eq}^{'} = \frac{(3)(6)}{3+6} = \frac{18}{9} = 2\Omega$. So the circuit becomes:



If we define a V' at the 2 ohms resistor, notice that it is the same V' as in the previous circuit (parallel elements). Computing V': $V' = \frac{2}{2+2}(12) = 6V$

In the previous diagram $i_0 = \frac{6V}{6\Omega} = 1A$. Going back to the first diagram: $V_0 = (1A)(2\Omega) = 2V$

RESULT: V_0=2V.