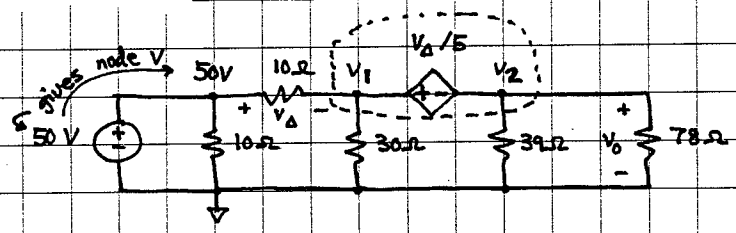
ex:



Use Node-Voltage method to find v_o.

Obvious place to put ref is at bottom of circuit.
We know we have 50V at top-left node. ∴ only 2 nodes unknown

Use the idea of a supernode: currents flowing out of dashed box in above figure sum to zero, and the controlled V-source gives us $V_1 - V_2 = V_\Delta/5$.

Super-Node 1&2: $\frac{V_1 - 50V}{10\Omega} + \frac{V_1 - 0V}{30\Omega} + \frac{V_2 - 0V}{39\Omega} + \frac{V_2 - 0V}{78\Omega} = 0\,A$

$V_1 - V_2 = V_\Delta/5$ from V-source inside supernode

$-V_\Delta = V_1 - 50V$ from definition of V_Δ on schematic

We have 3 eqns in 3 unknowns. Eliminate V_Δ. Then find V_2 by eliminating V_1. Why? because we want to find V_o, but $V_o = V_2$.

Using $-V_\Delta = V_1 - 50V$ in 2nd eqn: $V_1 - V_2 = -\frac{(V_1 - 50V)}{5}$

$\therefore V_2 = V_1 + \frac{V_1 - 50V}{5} = \frac{6}{5}V_1 - 10V \Rightarrow V_1 = \frac{5}{6}(V_2 + 10V)$

Plug this into 1st eqn: $\frac{5}{6}(V_2 + 10V)\left(\frac{1}{10\Omega} + \frac{1}{30\Omega}\right) + V_2\left(\frac{1}{39\Omega} + \frac{1}{78\Omega}\right) = \frac{50V}{10\Omega}$

$\frac{1}{10\Omega} + \frac{1}{30\Omega} = \frac{1}{10\Omega \| 30\Omega} = \frac{1}{10\Omega}\cdot\frac{1}{1\|3} = \frac{4}{30\Omega}$

$\frac{1}{39\Omega} + \frac{1}{78\Omega} = \frac{1}{39\Omega \| 78\Omega} = \frac{1}{39\Omega}\frac{1}{1\|2} = \frac{3}{78\Omega}$ $\quad \therefore \frac{5}{6}(V_2 + 10V)\frac{4}{30\Omega} + V_2\frac{3}{78\Omega} = 5A$

$V_2\left(\frac{5\cdot 4}{6\cdot 30\Omega} + \frac{3}{78\Omega}\right) = 5A - \frac{4.5\cdot 10V}{6\cdot 30\Omega}$ $\quad \therefore V_o = V_2 = \frac{35/9\ (A\cdot\Omega = V)}{1/9 + 3/78}$

or $V_o = 26V$