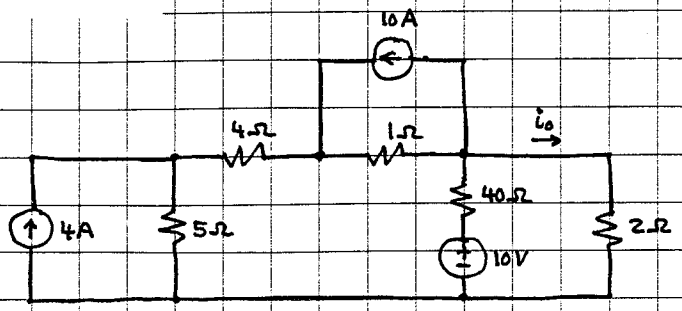
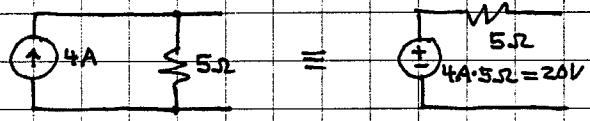
ex:



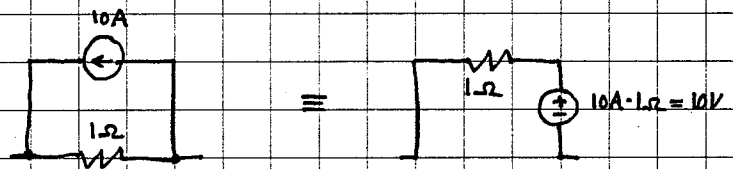
a) Find i_o using source transformations.

Note: We must avoid any transformations that would cause i_o to end up inside the transformed components, (or we change i_o). Thus, we work from left to right.

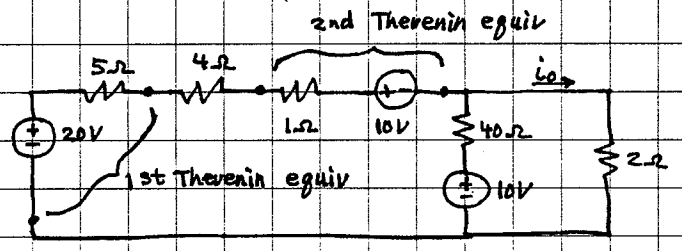
Transform 4A & 5Ω on left to Thevenin equivalent:



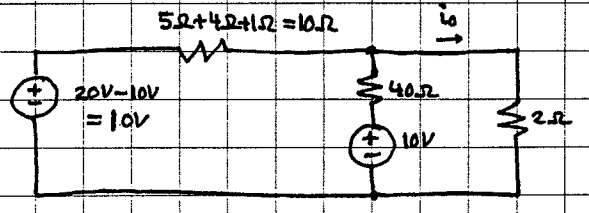
Transform 10A & 1Ω on top to Thevenin equivalent:



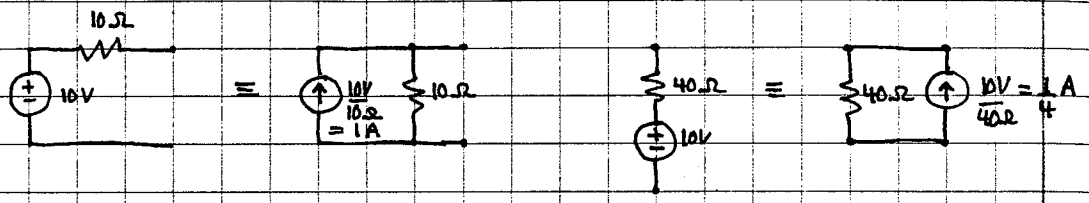
Now our circuit is:



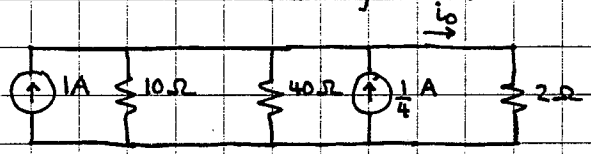
or



Transform the 10V, 10Ω to Norton equivalent, and
" " 10V, 40Ω " " "

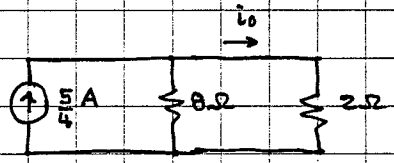


Now we have the following circuit:



Add the current sources; use parallel resistance $10\Omega \parallel 40\Omega = 10\Omega(1\parallel 4) = \frac{10\cdot 4}{5}\Omega = 8\Omega$

$1A + \frac{1}{4}A = \frac{5}{4}A$



Now we have current divider: $i_o = \frac{8\Omega}{2\Omega+8\Omega}\cdot\frac{5}{4}A = \frac{8}{10}\cdot\frac{5}{4}A = 1A$