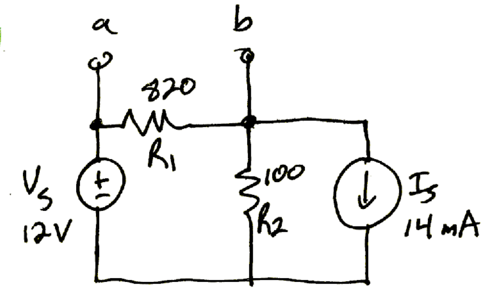
1



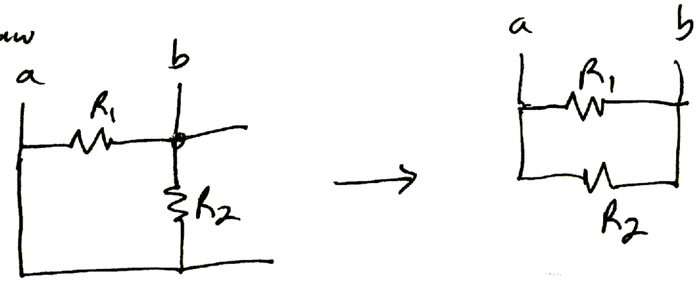
Find the Norton equivalent between a-b

Find $R_{Nor} = R_{Th}$. → Set all indep. sources to zero

$V_{source} \rightarrow \emptyset V$ (short circuit)

$I_{source} \rightarrow \emptyset A$ (open circuit)

redraw



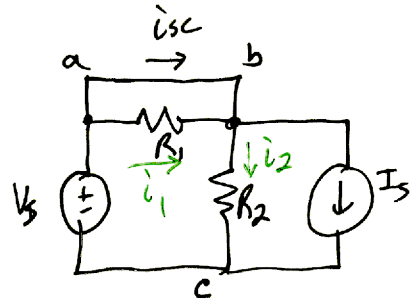
$$R_{ab} = R_{Nor} = R_{Th} = R_1 // R_2$$

$$= \frac{(820)(100)}{820+100} = 89.130\,\Omega$$

$$\boxed{89.1\,\Omega}$$

✓ matches

Find I short circuit (= I_{Nor})



KCL @ b

$$i_{sc} + i_1 = i_2 + I_s$$

① $$i_{sc} + \frac{V_{ab}}{R_1} = \frac{V_{bc}}{R_2} + I_s$$

here, $V_{ab} = \emptyset$ (short-circuit)

by KVL, $V_{bc} = V_S - \underbrace{V_{ab}}_{\emptyset}$

so $V_{bc} = V_S$

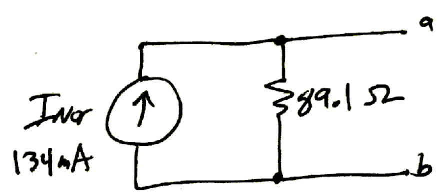
replace into ①

$$i_{sc} + \frac{\emptyset}{R_1} = \frac{V_S}{R_2} + I_S$$

$$i_{sc} = \underbrace{\frac{12V}{100\Omega}}_{120mA} + 14mA$$

$$\boxed{I_{Nor} = i_{sc} = 134\,mA}$$

✓ ~~the~~ matches



Thevenin equivalent: $V_{Th} = I_{Nor} \cdot R_{Nor}$

$$= (134mA)(89.1)$$

$$\boxed{V_{Th} = 11.943\ V}$$