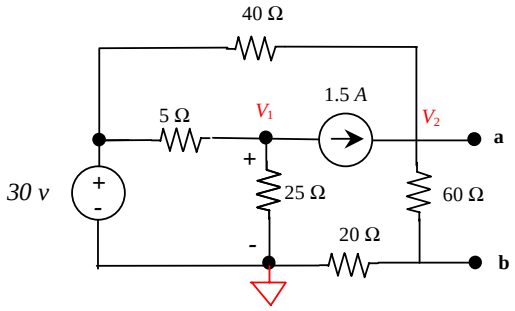
KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF ELECTRICAL ENGINEERING

EE 201 ELECTRIC CIRCUITS I

STUDENT'S NAME		SECTION 09 (10:00 - 10:50 AM SMW)
ID #:	QUIZ # 5 (Mon. 22 Oct., 01)	SCORE: /10

Solution

a. Find The Thevenin equivalent (***V_{TH}* and *R_{TH}***) with respect to the terminals a, b for the given circuit, by finding the open circuit voltage and the short circuit current.
b. Find the Thevenin resistance by deactivating the independent sources.



a. Using Node voltage method: only one equation is needed:

$$\frac{v_2 - 30}{40} + \frac{v_2}{80} - 1.5 = 0$$

$$2v_2 - 60 + v_2 = 120 \quad \rightarrow \quad 3v_2 = 180 \quad \rightarrow \quad \therefore v_2 = 60$$

$$v_{oc} = 60\frac{60}{80} = 45\,V$$

$$I_{sc} = \frac{30}{60} + 1.5\frac{40}{60} = 0.5 + 1 = 1.5\,A$$

$$R_{TH} = \frac{V_{oc}}{I_{sc}} = \frac{45}{1.5} = 30\,\Omega$$

b.

$$R_{TH} = \frac{60(60)}{60+60} = 30\,\Omega$$