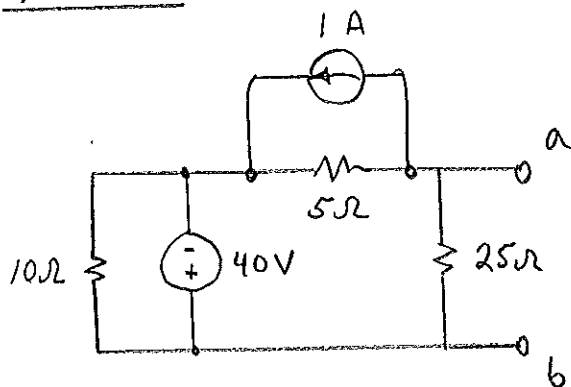


HW 5

DUE OCT. 10, 2013 THURSDAY

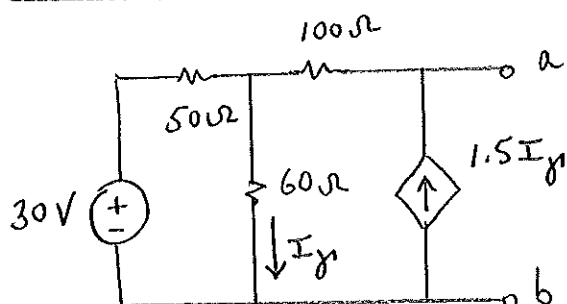
PROBLEM 1 THEVENIN EQUIVALENT CIRCUIT.



(a) FIND THE THEVENIN EQUIVALENT VOLTAGE, V_{TH} .

(b) FIND THE THEVENIN RESISTANCE, R_{TH} . (HINT: WHEN YOU DEACTIVATE THE VOLTAGE SOURCE THE 10Ω RESISTOR HAS A SHORT CIRCUIT ACROSS IT.)

PROBLEM 2 THEVENIN EQUIVALENT CIRCUIT

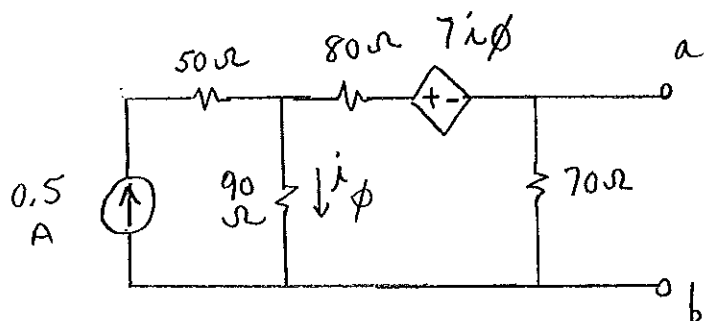


(a) FIND V_{TH} .

(b) FIND R_{TH} .

(c) FIND THE LOAD RESISTANCE, R_L , THAT WHEN ATTACHED TO a, b GIVES MAXIMUM POWER TRANSFER FROM THE CIRCUIT TO THE LOAD.

PROBLEM 3 NORTON EQUIVALENT CIRCUIT

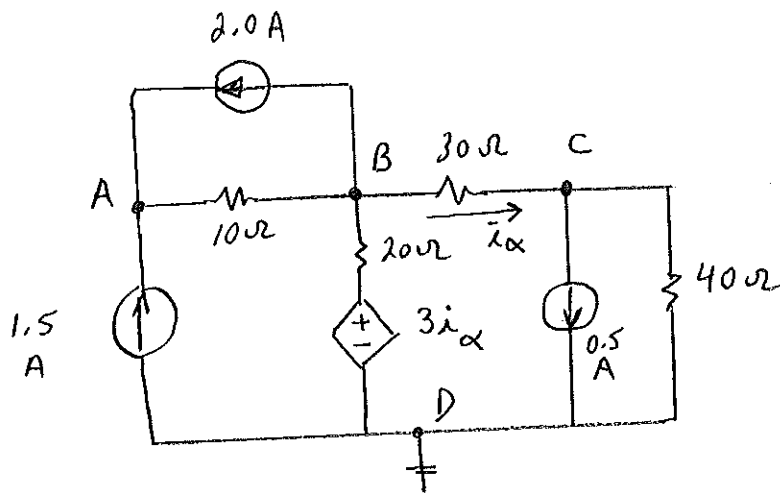


(a) FIND THE NORTON EQUIVALENT CURRENT, I_N .

(b) FIND THE NORTON EQUIVALENT RESISTANCE, R_N .

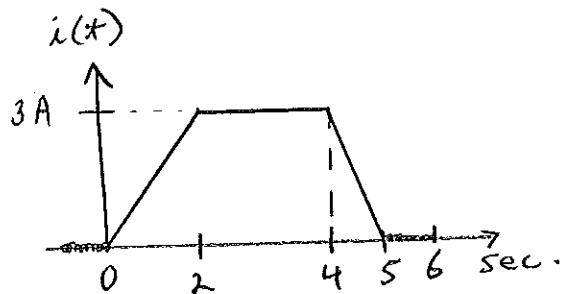
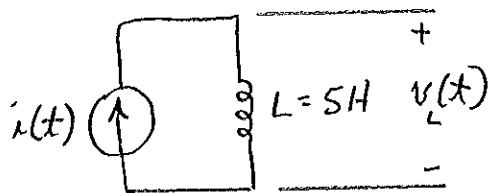
(c) IF $R_L = 300\Omega$ IS ATTACHED TO a, b TERMINALS, WHAT IS THE POWER (AND SIGN) IN THE 300Ω RESISTOR?

PROBLEM 4. SUPERPOSITION



- DEACTIVATE THE 1.5 A AND 2.0 A CURRENT SOURCES AND USE NODE VOLTAGE ANALYSIS TO FIND THE ESSENTIAL NODE VOLTAGES.
- DEACTIVATE THE 0.5 A CURRENT SOURCE AND USE NODE VOLTAGE ANALYSIS TO FIND THE ESSENTIAL NODE VOLTAGES.
- FIND THE ESSENTIAL NODE VOLTAGES WHEN ALL SOURCE ARE ON. (HINT: DON'T DO A NEW NODE VOLTAGE ANALYSIS.)

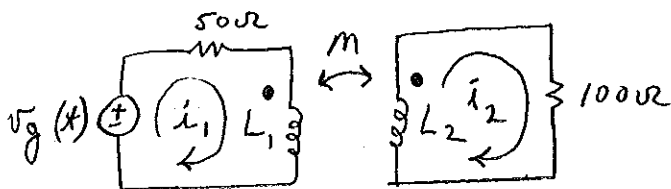
PROBLEM 5. INDUCTOR



GIVEN $i(t)$ SHOWN BELOW:

- FIND $v_L(t)$, AND PLOT FOR 6 SEC.
- FIND $p_L(t)$, AND PLOT FOR 6 SEC.
- FIND $w_L(t)$, AND PLOT FOR 6 SEC.

PROBLEM 6 TRANSFORMER.



WRITE THE MESH CURRENT EQUATIONS FOR $i_1(t)$ AND $i_2(t)$. PUT ANSWER IN A BOX SO IT IS EASY TO GRADE.