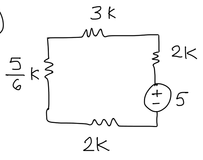
Wednesday, February 14, 2024 5:20 PM

Problem 1:

a) R3 & R4 in series

b) R1 & R2 in parallel

c)



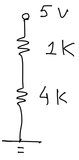
$$V_{R5} = \frac{2 \times 5}{5 + 2 + 5/6} = 1.277 \text{ V}$$

d) current in total $= \frac{5}{7.833} = 0.6383$

current through R1 (5K) = 0.1063

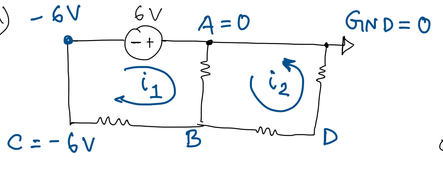
e) $R_{eq} = 7.833$

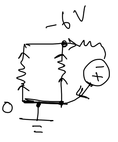
f)



Problem 2

a)





b) unknown voltages: 2
unknown currents: 2

c) ?

d) $i_1 R_1 + (i_1 + i_2) R3 = 6$

$(i_2 + i_1) R3 + i_2 R4 + i_2 R2 = 0$

e) $6i_1 + 5i_2 = 6$

$5i_1 + 12 i_2 = 0$

$$\begin{bmatrix} 6 & 5 \\ 5 & 12 \end{bmatrix} \begin{bmatrix} i_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} 6 \\ 0 \end{bmatrix}$$

$\Rightarrow i_1 = 1.532$ A;
$i_2 = -0.6383$ A.

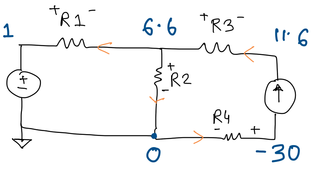
$V_B = -4.4685$

$V_D = -1.9149$

Problem 3

a) False

b)



$V_{R1} = -5.6$ V

$V_{R2} = 6.6$ V

$V_{R3} = -5$ V

$V_{R4} = -30$ V

c)

V+ | 1- | 2-

1+ | 2+ | ⏚