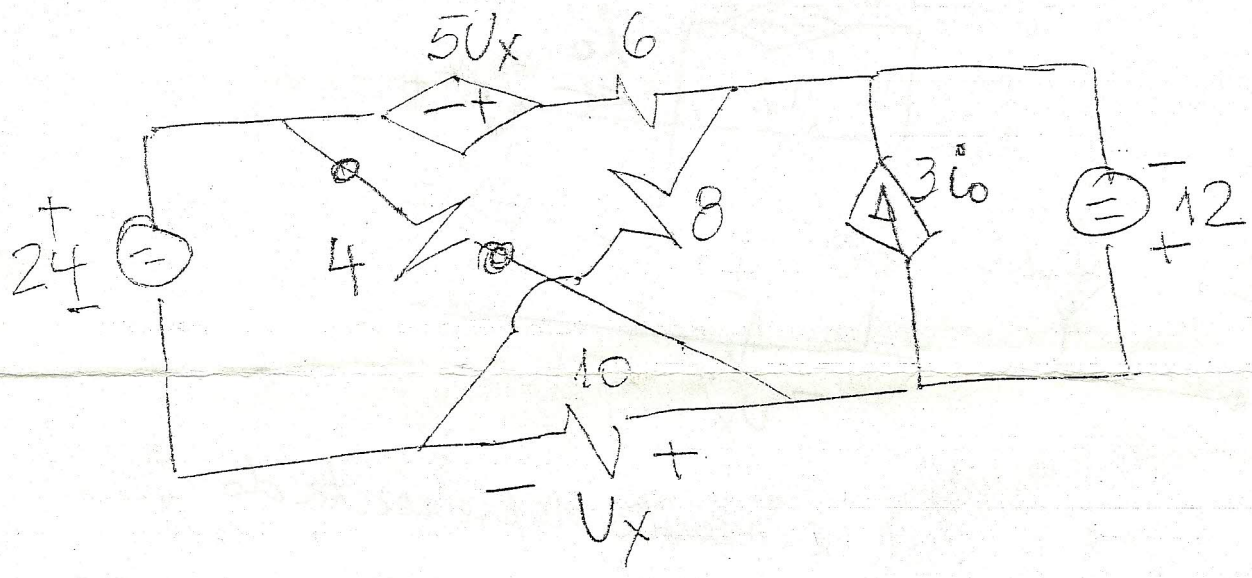


EXAMEN 2011-1201010  
 CIRCUITOS ELECTRICOS I  
 Grupo 01 T

15(40)  
 Julio  
 2011

PROBLEMA - Dado el siguiente circuito.  
 Calcular la corriente  $I$  en la resistencia  
 de  $(\Omega)$ . Aplicando el Teorema de THEVENIN



Alcald

# EXAMEN PARCIAL

140 (Lunes)

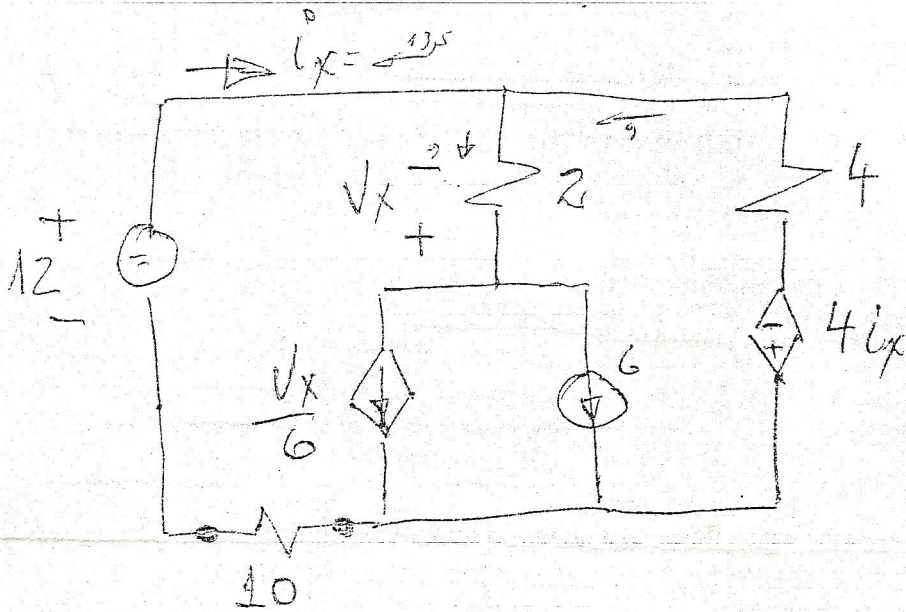
MAYO

2011

## CIRCUITOS ELECTRICOS I

GRUPO 01T

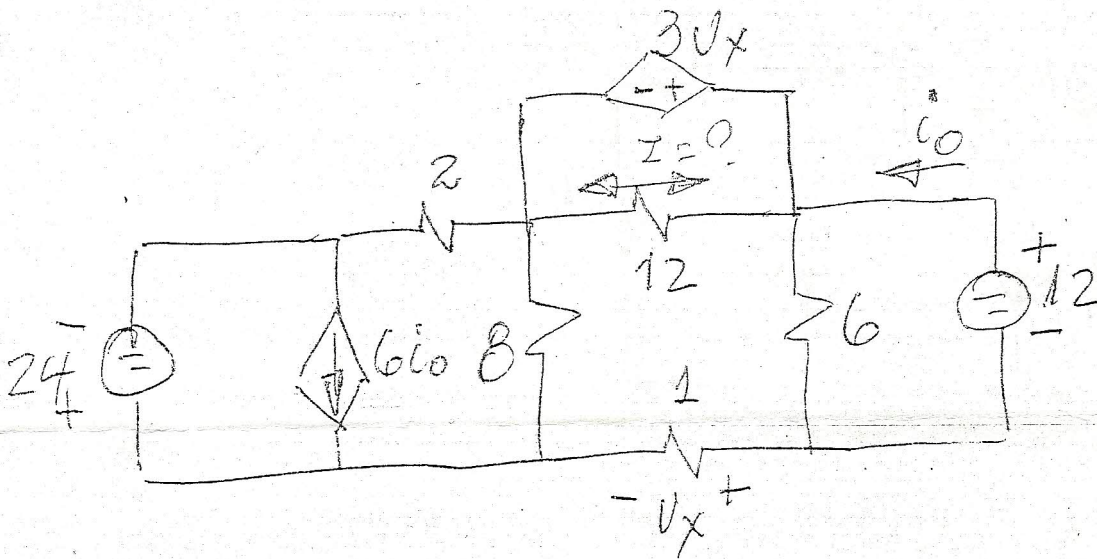
RESOLVER - por cualquier método



VERIFICAR -- Calcular la corriente en 10Ω  
utilizando el TEOREMA DE THEVENIN

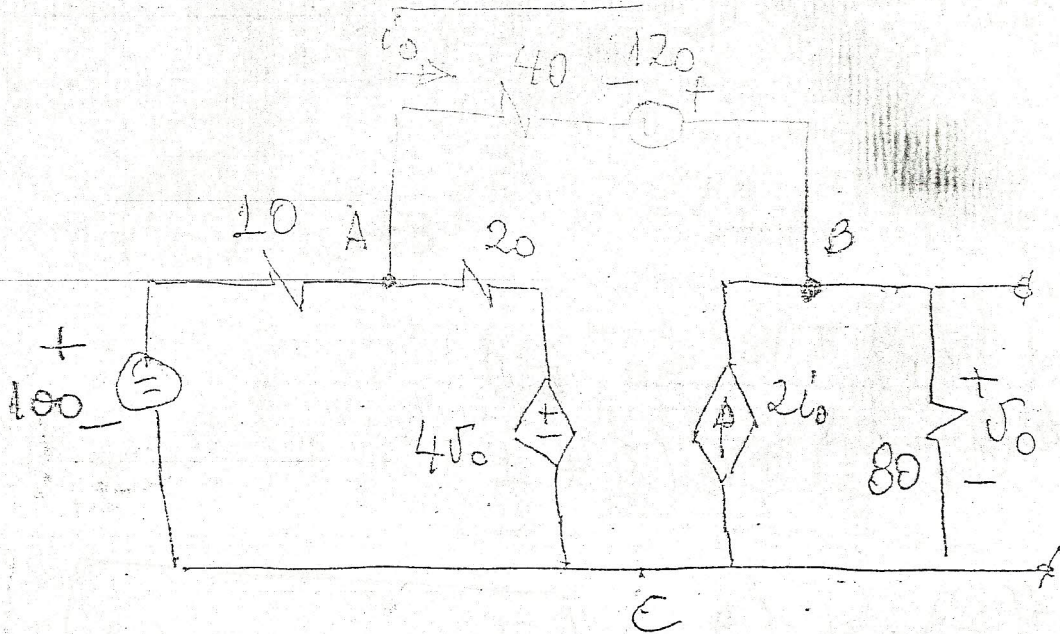
Arredas

PROBLEMA — Dado el siguiente circuito calcular la corriente  $I = ?$  en la resistencia de  $12\ \text{ohm}$ , aplicando el Teorema de Thevenin



# RESOLVER

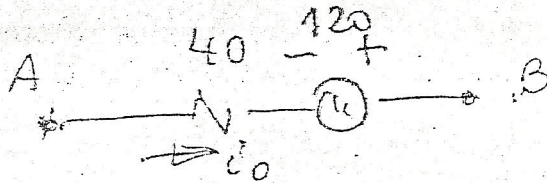
1/2



$$\text{Node (A)} \quad \frac{100}{10} + \frac{4V_0}{20} - \frac{120}{40} = V_A \left( \frac{1}{10} + \frac{1}{40} + \frac{1}{20} \right) - V_B \left( \frac{1}{40} \right)$$

$$\text{Node (B)} \quad 2i_0 + \frac{120}{40} = -V_A \left( \frac{1}{40} \right) + V_B \left( \frac{1}{40} + \frac{1}{80} \right)$$

$$\boxed{V_0 = V_B}$$



$$V_B = V_A - i_0(40) + 120$$

$$i_0 = \frac{V_A + 120 - V_B}{40}$$

$$\text{Node (A)} \quad \frac{100}{10} - 3 + \frac{4V_B}{20} = V_A \left( \frac{7}{40} \right) - V_B \left( \frac{1}{40} \right)$$

$$\text{Node (B)} \quad 2 \left[ \frac{V_A + 120 - V_B}{40} \right] + 3 = -V_A \left( \frac{1}{40} \right) + V_B \left( \frac{3}{80} \right)$$

$$\frac{V_A}{20} + 3 - \frac{V_B}{20} + 3 = -V_A \left( \frac{1}{40} \right) + V_B \left( \frac{3}{80} \right)$$

$$\left\{ \begin{aligned} 7 &= V_A \left( \frac{7}{40} \right) - V_B \left( \frac{1}{40} \right) - V_B \left( \frac{1}{5} \right) \end{aligned} \right. \quad \frac{2}{2}$$

$$9 = -V_A \left( \frac{1}{40} \right) - V_A \left( \frac{1}{20} \right) + V_B \left( \frac{3}{80} \right) + V_B \left( \frac{1}{20} \right)$$

$$\left\{ \begin{aligned} 7 &= -V_A \left( \frac{7}{40} \right) - V_B \left( \frac{1}{40} + \frac{1}{5} \right) \end{aligned} \right.$$

$$9 = -V_A \left( \frac{1}{40} + \frac{1}{20} \right) + V_B \left( \frac{3}{80} + \frac{1}{20} \right)$$

$$7 = V_A \left( \frac{7}{40} \right) - V_B \left( \frac{9}{40} \right)$$

$$9 = -V_A \left( \frac{3}{40} \right) + V_B \left( \frac{7}{80} \right)$$

$$V_A = -1688 \text{ (V)}$$

$$V_B = -1344 \text{ (V)}$$

$$i_0 = \frac{V_A + 120}{40} - \frac{V_B}{40} = \frac{-1688 + 120 - (-1344)}{40}$$

$$i_0 = \frac{-1688 + 120 + 1344}{40} = \frac{-224}{40} = -5.6 \text{ (A)}$$

$$i_0 = -5.6 \text{ (A)}$$