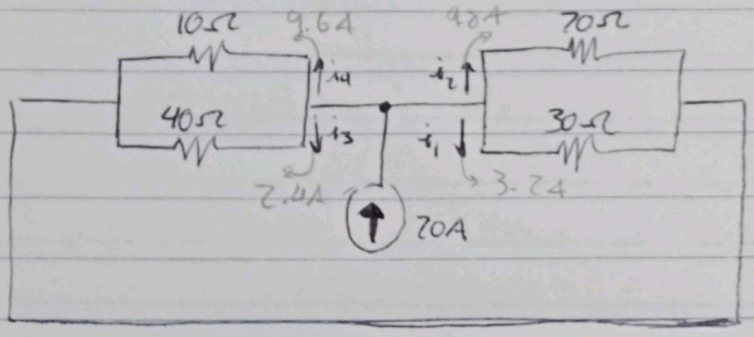
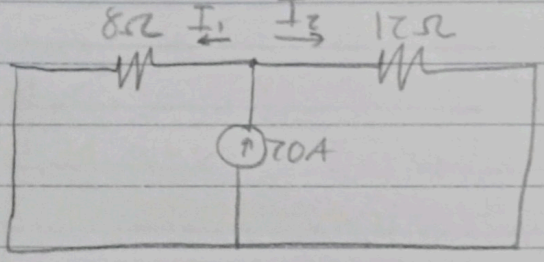
1. Encuentre las corrientes i_1, i_2, i_3 e i_4 en el siguiente circuito



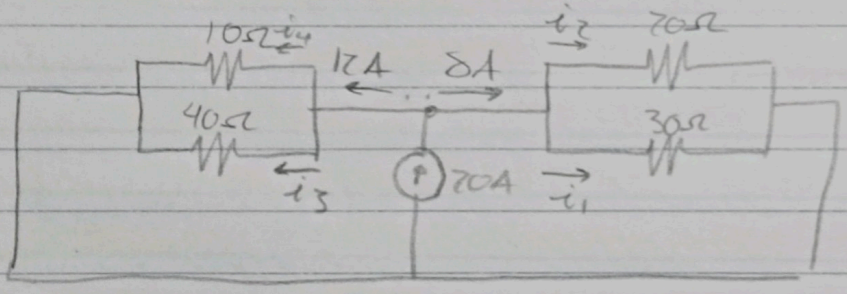
$10 \| 40 = 8$

$70 \| 30 = 12$



Por divisor de corriente

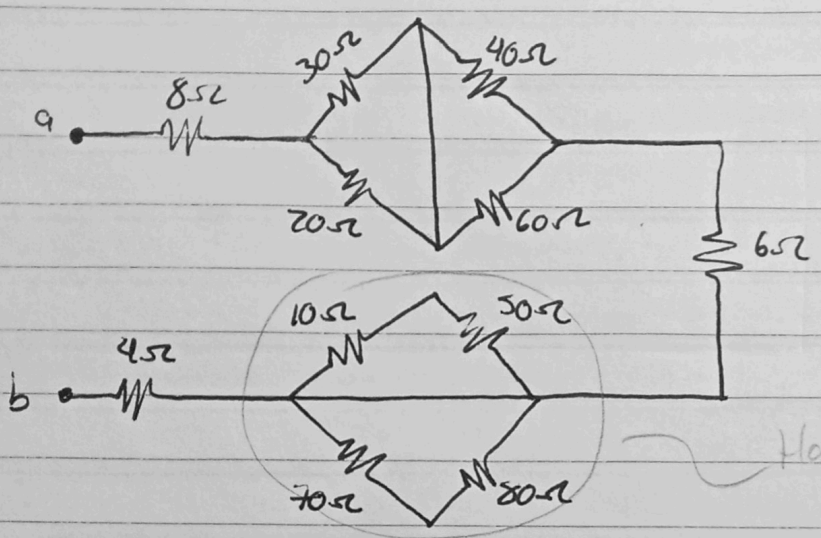
$$I_1 = \frac{(70A)(12)}{12+8} = 12A \; ; \; I_2 = \frac{(70A)(8)}{12+8} = 8A$$



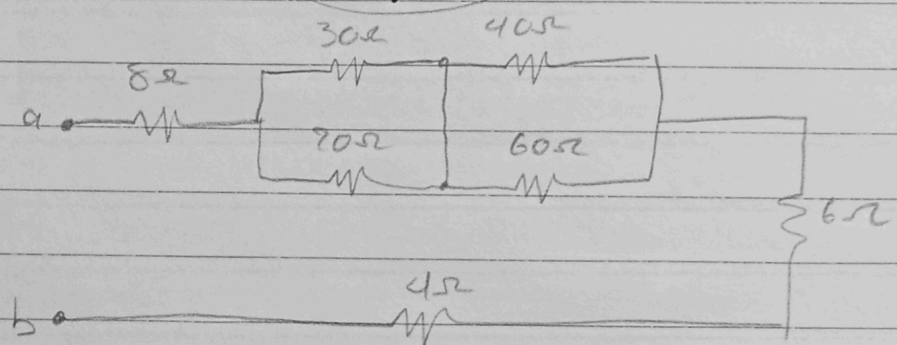
$$i_1 = \frac{(8A)(70)}{70+30} = 3.7A \qquad i_3 = \frac{(12A)(10)}{10+40} = 2.4A$$

$$i_2 = \frac{(8A)(30)}{70+30} = 4.8A \qquad i_4 = \frac{(12A)(40)}{10+40} = 9.6A$$

2. Encuentra la resistencia equivalente entre las terminales a, b del siguiente circuito

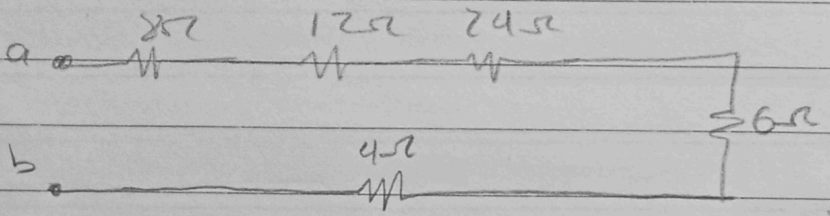


Hay un corto circuito



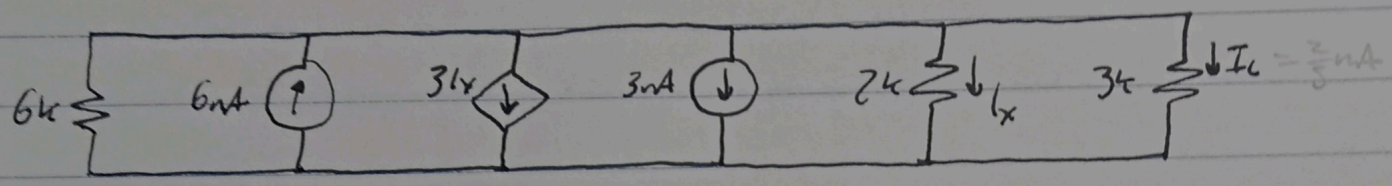
$30 \| 70 = 21\,\Omega$

$40 \| 60 = 24\,\Omega$

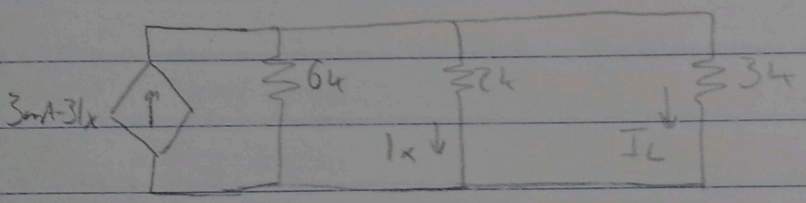


$R_{ab} = 8 + 21 + 24 + 6 + 4 = 59\,\Omega$

3. Determine I_L en el siguiente circuito.



6mA - 3mA - 3Ix



$R_T = 6k \| 2k \| 3k \| = 1k$

1.5k

$I_L = (3mA - 3Ix)\frac{1k}{3k} = 1mA - Ix$

$= 1mA - \frac{3}{5}mA$

$= \frac{2}{5}mA$

$I_x = (3mA - 3Ix)\frac{1k}{2k}$

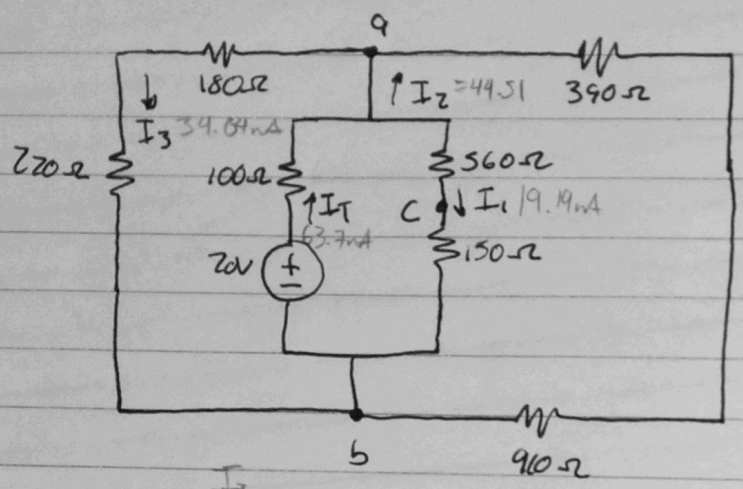
$2Ix = 3mA - 3Lx$

$2Ix + 3Ix = 3mA$

$5Ix = 3mA$

$Ix = \frac{3}{5}mA$

4. En el siguiente circuito encuentre: R_t (resistencia equivalente medida en los terminales de la fuente de 20v), I_1, I_2, I_3, I_4, V_{ab} (voltaje entre los nodos a y b) y V_{bc}



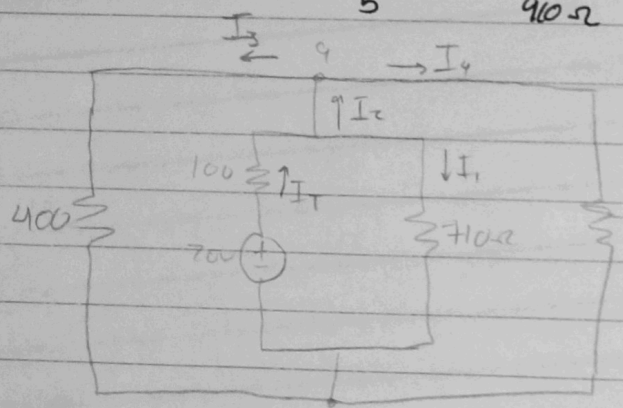
720 → 180 = 400

390 → 110 = 1,300

560 → 150 = 710

$V_{bc} = -I_1 150 = -19.19mA(150) = 2.87V$

$V_{ab} = I_4(390+910) = 10.47mA(134) = 13.61V$

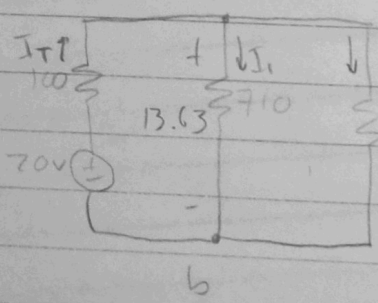


400//134 = 305.8Ω

$I_4 = \frac{I_2(400)}{1.7k} = \frac{(49.51mA)(400\Omega)}{1.7k} = 10.47mA$

$I_2 = I_4 + I_3 \Rightarrow I_3 = I_2 - I_4 = 49.51mA - 10.47mA$

$= 34.04mA$

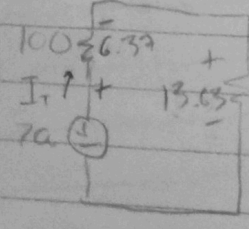


710//305.8Ω = 213.7Ω

$I_1 = \frac{13.63}{710} = 19.19mA$

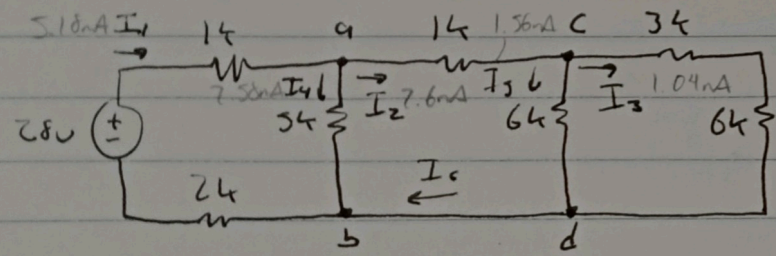
$I_T = I_2 + I_1 \Rightarrow I_2 = I_T - I_1 = 63.7mA - 19.19mA$

$= 44.51mA$



$I_T = \frac{6.37}{100} = 63.7mA$

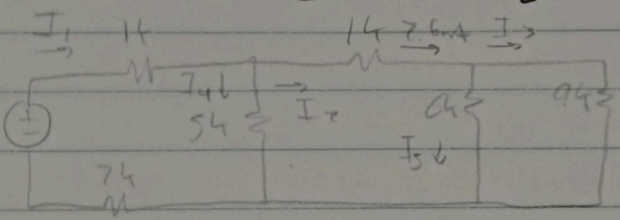
5. Analiza el siguiente circuito y encuentra las corrientes $I_1, I_2, I_3, I_4, I_5, I_6$ y los voltajes V_{ab} y V_{cd}. Encuentra la potencia en cada elemento.



$3\Omega \to 6\Omega = 9\Omega$

$V_{ab} = (5\Omega)(2.58mA) = 12.9V$

$V_{cd} = (6\Omega)(1.56mA) = 9.36V$

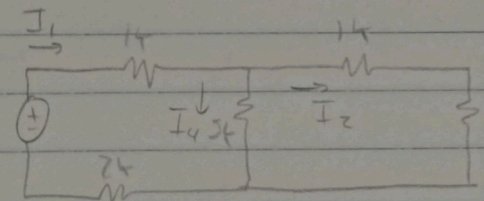


$6\Omega \| 9\Omega = 3.6\Omega$

$I_3 = \frac{I_2 6}{6+9} = \frac{7.6mA(6)}{15} = 1.04mA$

$I_2 = I_5 + I_3 \Rightarrow I_5 = I_2 - I_3 = 1.56mA$

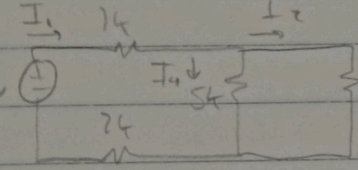
$1\Omega \to 3.6\Omega = 4.6\Omega$

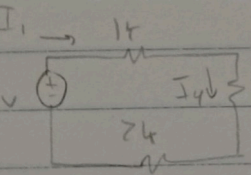


$5\Omega \| 4.6\Omega = 2.4\Omega$

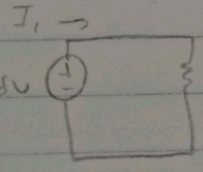
$I_2 = \frac{I_1 5}{9.6} = \frac{5.18mA(5)}{9.6} = 2.6mA$

$I_1 = I_4 + I_2 \Rightarrow I_4 = I_1 - I_2 = 2.58mA$





$1\Omega \to 2.4\Omega \to 2\Omega = 5.4\Omega$



$I_1 = \frac{28V}{5.4\Omega} = 5.18mA$