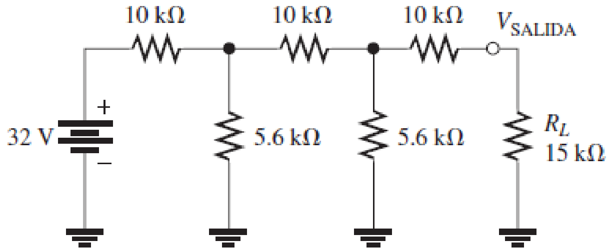
17. Con el teorema de Thevenin, determine la corriente a través de la carga R_L en la figura 8-77.

▶ **FIGURA 8–77**



$$V_{TH} = \left(\frac{R_4}{\frac{R_2 R_3 R_4}{R_3R_4 + R_2R_4 + R_2R_3} + R_1}\right) V_s \qquad R_{eq_{1|2|3|4}} = \frac{R_2 R_3 R_4}{R_3R_4 + R_2R_4 + R_2R_3}$$

$$V_{TH} = \left(\frac{5,6}{12,19}\right) 32 = 14,7 V$$

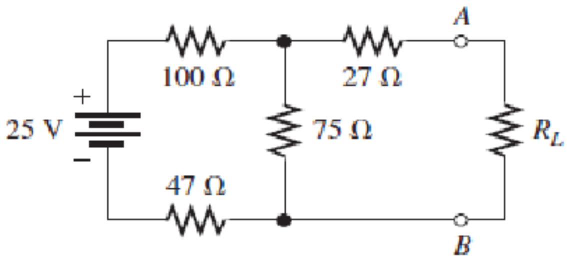
$$\frac{1}{R_{1|2|3|4}} = \frac{1}{10} + \frac{2}{5,6} = 1,79 k\Omega$$

$$R_{TH} = 1,79 + 10 = 11,79 k\Omega$$

$$V_L = \left(\frac{R_L}{R_{TH} + R_L}\right) V_{TH} = 8,23 V$$

$$I_L = \frac{V_L}{R_L} = 548,7 \mu A$$

23. Para cada uno de los circuitos mostrados en la figura 8-76, determine el equivalente Norton visto por R_L.



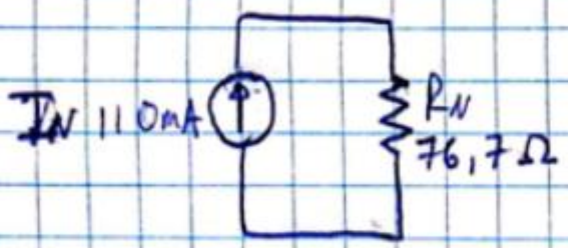
$$R_T = R_1 + R_4 + \frac{R_2 R_3}{R_2 + R_3}$$

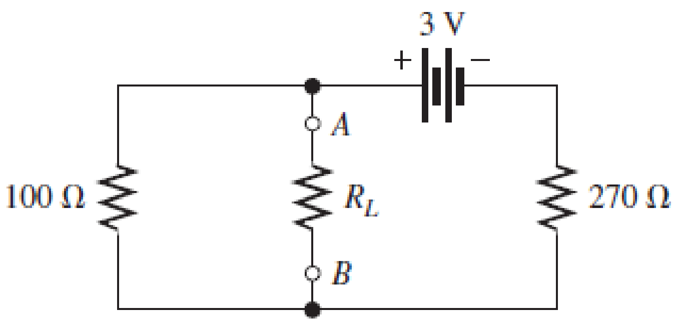
$$R_T = 100 + 47 + \frac{75 \cdot 27}{75 + 27} = 166,85\,\Omega$$

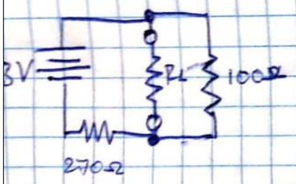
$$I_T = \frac{V_s}{R_T} = \frac{25}{166,85} = 0,15\,A$$

$$I_N = \left(\frac{R_2}{R_2 + R_3}\right) 0,15 = 110\,mA$$

$$R_N = \left(\frac{1}{R_1 + R_2} + \frac{1}{R_2}\right)^{-1} + R_3 = 76,7\,\Omega$$





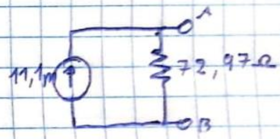


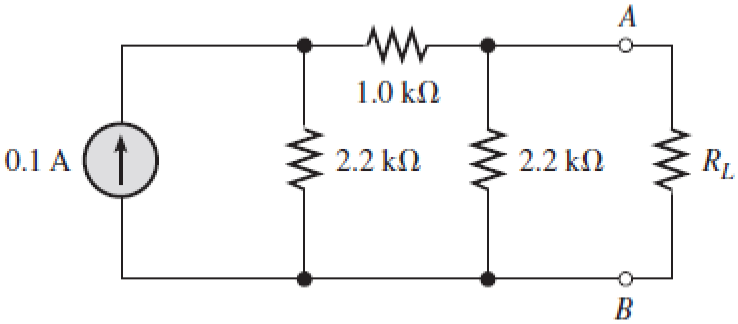
$$R_T = \left(\frac{1}{100} + \frac{1}{270}\right)^{-1} = 72,97\ \Omega$$

$$I_T = \frac{3}{72,97} = 41\,mA$$

$$I_N = \left(\frac{R_1}{R_1+R_2}\right) I_T = 11,1\,mA$$

$$R_N = \left(\frac{1}{100} + \frac{1}{270}\right)^{-1} = 72,97\ \Omega$$





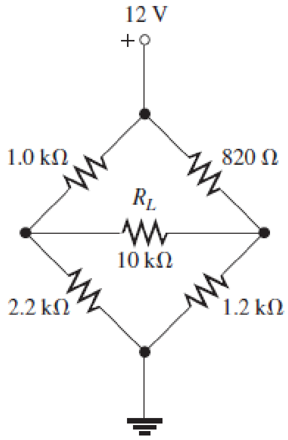
$$R_T = \left(\frac{1}{2,2} + \frac{1}{3,2}\right)^{-1} = 1,3\,K\Omega$$

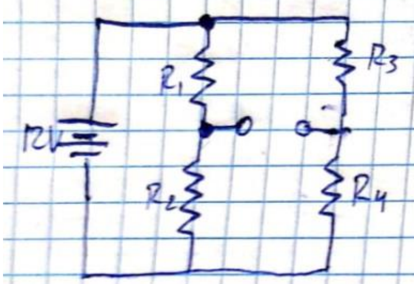
$$I_T = 0,1A$$

$$I_N = \left(\frac{R_3}{R_2+R_3}\right) I_T = 68,8\,mA$$

$$R_N = \left(\frac{1}{R_1+R_2} + \frac{1}{R_3}\right)^{-1} = 1,3\,K\Omega$$

27. Determine el circuito equivalente Norton para el puente que aparece en la figura 8-81 sin R_L.





$$R_T = \left(\frac{R_1 R_2}{R_1+R_2}\right) + \left(\frac{R_3 R_4}{R_3+R_4}\right) = 1,175\,K\Omega$$

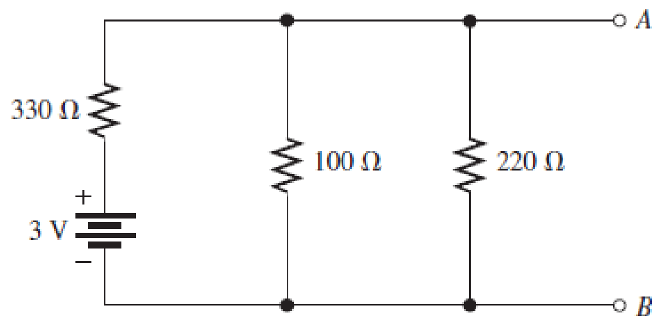
$$I_T = \frac{V_S}{R_T} = 10,22\,mA$$

$$I_N = \left(\frac{R_1+R_2}{R_1+R_2+R_3+R_4}\right) I_T = 6,51\,mA$$

$$R_N = 1,175\,K\Omega$$

29. Aplique el teorema de Norton al circuito de la figura 8-84.

▶ **FIGURA 8–84**



$$R_T = R_1 + \frac{R_2\, R_3}{R_2 + R_3} = 398,75\,\Omega$$

$$I_T = \frac{V_S}{R_T} = 7,52\,mA$$

$$I_N = \left(\frac{R_1 \parallel R_2}{R_1 \parallel R_2 + R_3}\right) I_T = 1,94\,mA$$

$$R_N = \left(\frac{1}{330} + \frac{1}{100} + \frac{1}{220}\right)^{-1} = 56,9\,\Omega$$