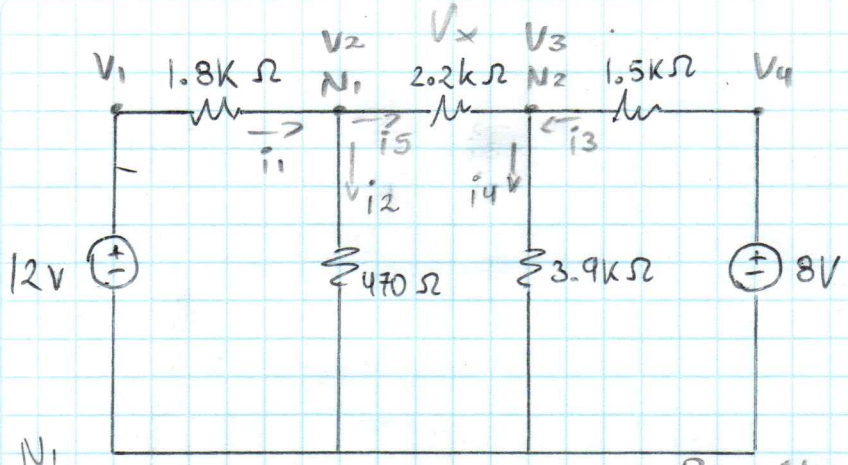

$i_5 = i_1 - i_2$

$\frac{V_2 - V_3}{2200} = \frac{12 - V_2}{1800} - \frac{V_2}{470}$

$29,2\,V_2 - 4,23\,V_3 = 62,0$

① $V_2 = \frac{62,04 + 4,23\,V_3}{29,2}$

Para N_1

$i_1 = i_5 + i_2$

$i_5 = i_1 - i_2$

Para N_2

$i_5 + i_3 = i_4$

$i_5 = i_4 - i_3$

$i_1 - i_2 = i_4 - i_3$

$i_1 + i_3 = i_4 + i_2$

$$\frac{V_1 - V_2}{1.8K} + \frac{V_4 - V_3}{1.5K} = \frac{V_3}{3.9K} + \frac{V_2}{470}$$

$$\frac{12 - V_2}{1800} + \frac{8 - V_3}{1500} = \frac{V_3}{3900} + \frac{V_2}{470}$$

$$\frac{12 - V_2}{1800} - \frac{V_2}{470} = \frac{V_3}{3900} - \frac{8 - V_3}{1500}$$

$$\frac{470(12 - V_2) - 1800\,V_2}{1800(470)} = \frac{1500\,V_3 - 3900(8 - V_3)}{(3900)(1500)}$$

$(5850K)\,(5640 - 470\,V_2 - 1800\,V_2) = 846k\,(1500\,V_3 - 31,2K + 3900\,V_3)$

$325\,(5640 - 2270\,V_2) = 47\,(5400\,V_3 - 31,2k)$

$1833K - 737750\,V_2 = 253800\,V_3 - 1466,4K$

$1833 - 737,75\,V_2 = 253,8\,V_3 - 1466,4$

$253,8\,V_3 + 737,75\,V_2 = 3299.4$ ②

① → ② $253,8\,V_3 + 737,75\,\frac{(62,04 + 4,23\,V_3)}{29,2} = 3299.4$

$V_1 = 12\,V$ $\quad V_3 = 4.8\,V$ $\quad V_x = (4.8 - 2.82)\,V$

$V_4 = 8\,V$ $\quad V_2 = 2.82\,V$ $\quad V_x = 1.98\,V$