

$V_1 = 3V$
 $V_2 = 5V$
 $V_3 = 2V$
 $V_4 = 12V$

$MI: -I_1 R_1 - I_2 R_2 - I_3 R_3 - I_4 R_4 + 3V = 0$
 $II: I_3 R_3 - 5V + I_5 R_5 = 0$
 $III: 3V + I_4 R_4 - I_5 R_5 - 2V + I_6 R_6 + 12V = 0$
 $N_1: I_1 + I_2 - I_3 = 0$
 $N_2: -I_1 - I_2 + I_4 = 0$
 $N_3: I_3 - I_5 - I_4 = 0$

I_1	I_2	I_3	I_4	I_5	I_6	
-3	0	-3	-4	0	0	-3
0	0	3	0	5	0	5
0	0	0	4	-5	+6	-7
1	1	-1	0	0	0	0
-1	0	0	1	0	0	0
0	0	1	-1	-1	0	0

$$I_1 = \frac{289}{567} = 0.51 A$$

$$I_2 = \frac{41}{567} = 0.07 A$$

$$I_3 = \frac{110}{189} = 0.58 A$$

$$I_4 = \frac{-13}{189} = -0.068 A$$

$$I_5 = \frac{41}{63} = 0.65 A$$

$$I_6 = \frac{-328}{567} = -0.58 A$$

La respuesta:

$$\begin{aligned} x_1 &= \frac{289}{567} \\ x_2 &= \frac{110}{189} \\ x_3 &= \frac{-41}{567} \\ x_4 &= \frac{41}{63} \\ x_5 &= \frac{13}{189} \\ x_6 &= \frac{328}{567} \end{aligned}$$

$$I_a = \frac{289}{3} A = 96,3 A$$

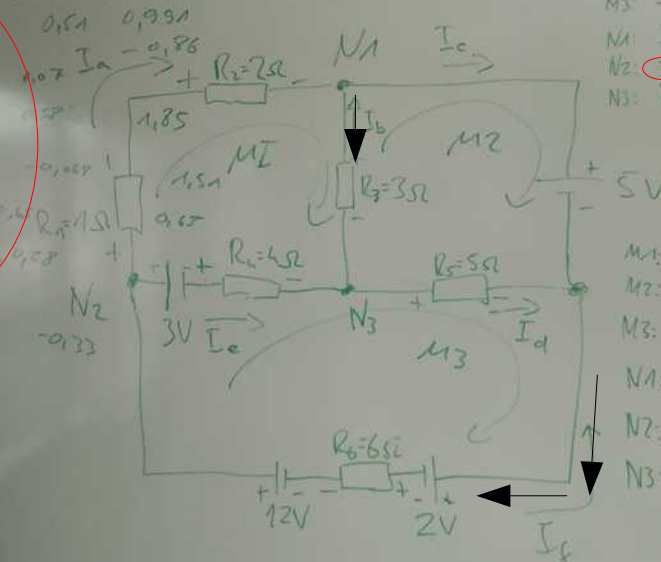
$$I_b = -30 A$$

$$I_c = \frac{37}{3} A = 12,3 A$$

$$I_d = 1 A$$

$$I_e = 4 A$$

$$I_f = \frac{142}{3} A = 47,3 A$$



$$\begin{aligned} M1: -R_1 I_a - R_2 I_b - R_3 I_c + R_4 I_e + 3V &= 0V \checkmark \\ M2: R_5 I_b - 5V + R_6 I_d &= 0V \checkmark \\ M3: -3V - R_7 I_c - R_8 I_d - 2V - R_9 I_e + 12V &= 0V \checkmark \\ N1: I_a - I_b - I_c &= 0A \checkmark \\ N2: I_a - I_c + I_d &= 0A \checkmark \\ N3: I_b - I_d + I_e &= 0A \checkmark \end{aligned}$$

$$-95 \quad 196 \quad 283,8$$

$$I_a \quad I_b \quad I_c \quad I_d \quad I_e \quad I_f$$

	I_a	I_b	I_c	I_d	I_e	I_f
M1:	-3	-3	0	0	4	0
M2:	0	3	0	5	0	0
M3:	0	0	0	-5	-4	6
N1:	1	-1	-1	0	0	0
N2:	1	0	0	0	-1	1
N3:	0	1	0	-1	1	0