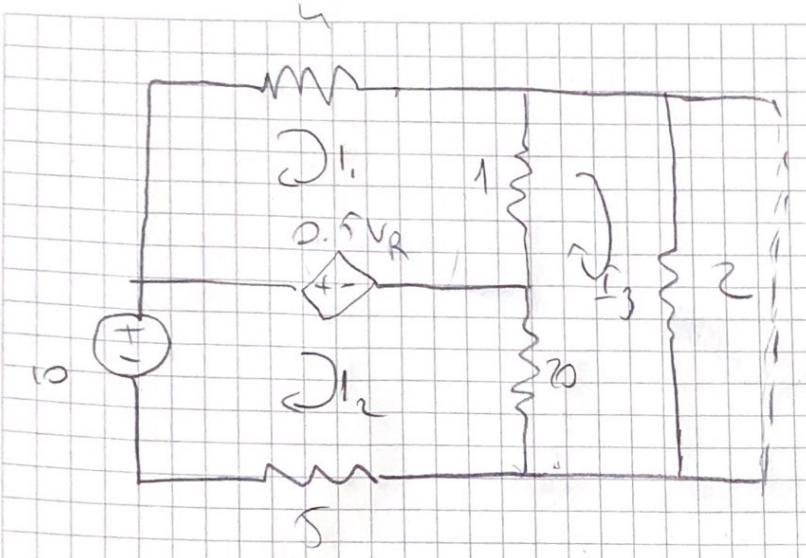


$V_{th} = \frac{40}{37} \cdot 2$

$\frac{80}{37}$

1 / $i_1 \cdot 4 + 1(i_1 - i_3) - 0.5 I_1 - I_3 \cdot 2 = 0$

2 / $-I_3 + (I_2 - I_3) \cdot 20 + i_2 \cdot 5 = 10$

3 / $I_3 \cdot 2 + (i_3 - i_2) \cdot 20 + (i_3 - i_1) = 0$

$-20 i_3$

$-19 i_3$

$23 i_3$

1 / $5i_1 + 0i_2 - 2i_3 = 0$

2 / $i_1 0 + 25 i_2 - 19 i_3 = 10$

3 / $-i_1 - 20 i_2 \; 23 i_3$

$I_1 = \frac{16}{37}$

$I_2 = \frac{226}{185}$

$I_3 = \frac{40}{37}$

4 / $10 - i_1 \cdot 4 - i_3 \cdot 2 - i_2 \cdot 5 = 0$

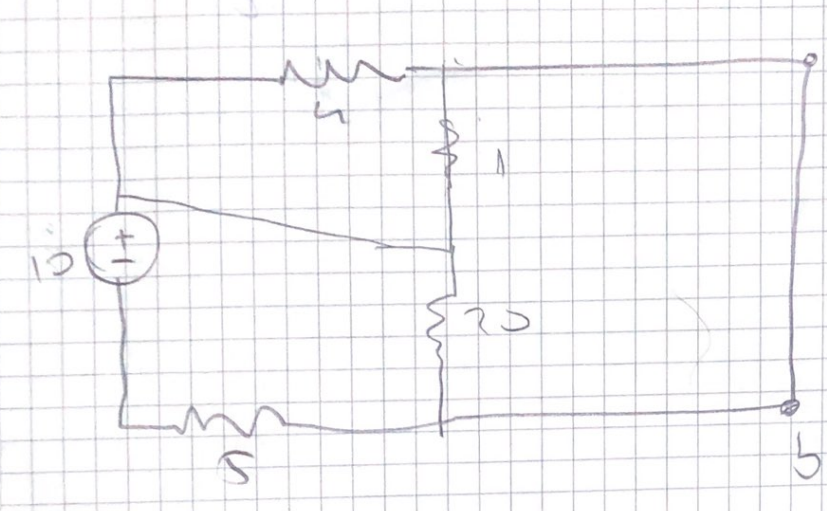
$4i_1 + 5i_2 + 2i_3 = 10$

with short circuit V_R cancels

dependent source cancels

$V_1 =$

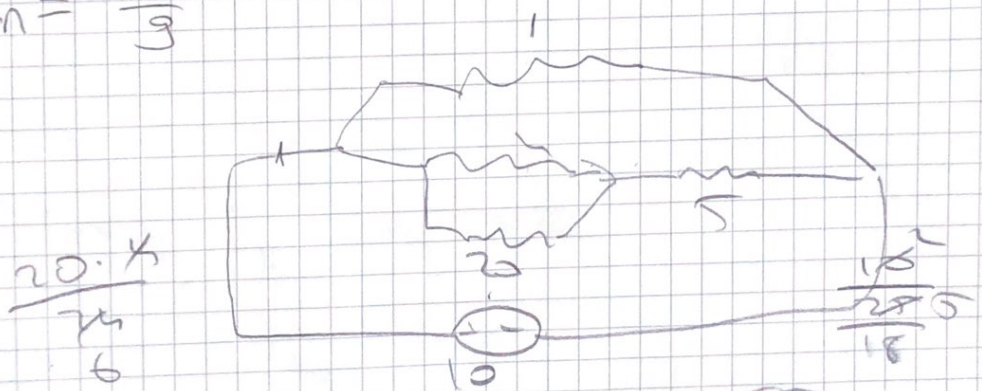
circuit would be like this



$\frac{40}{37} \cdot 2$

$\frac{80}{37} = 2.16$

$I_n = \frac{10}{9}$ 1.95



$\frac{20 \cdot 4}{24}$ 6

$\frac{18^2}{25}$ 5 / 18

$\frac{10+5}{3} \cdot \frac{25}{3}$

$\frac{\frac{20}{3} \cdot 1}{6}$

$\frac{20}{18}$

$\frac{36}{20}$