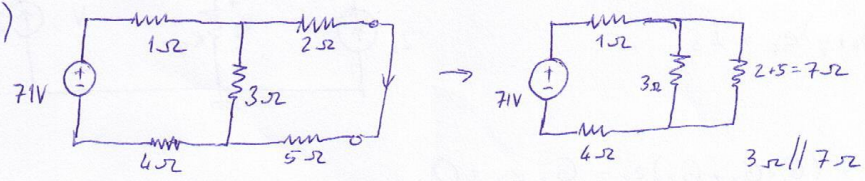
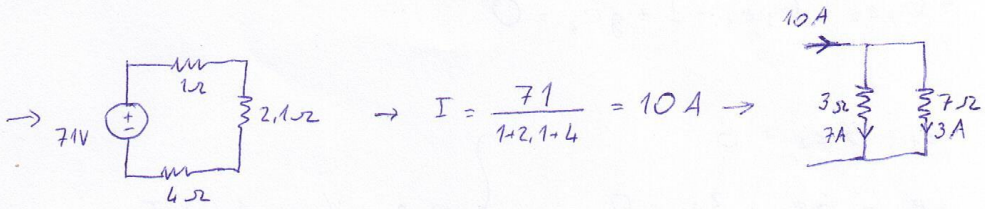
2017-2018 Spring BoEC

Solutions of HW6

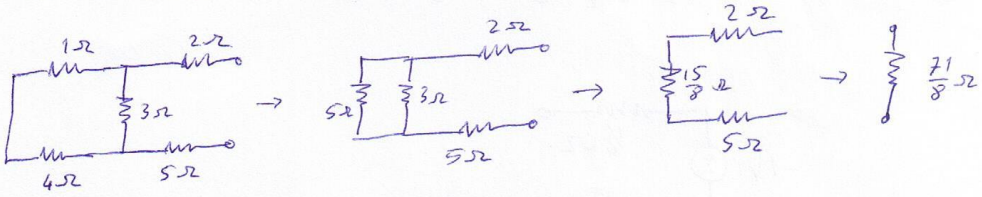
1)

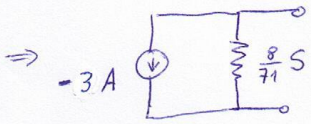


Let's find short circuit current



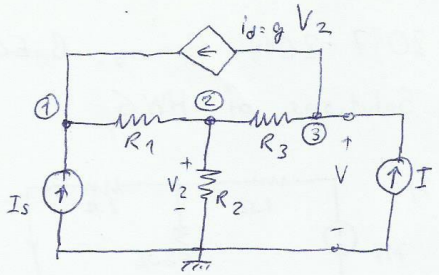
Let's find resistance of the one port:





2) ① $-I_S + G_1 e_1 - G_1 e_2 - i_d = 0$

$i_d = g V_2 = g e_2$



$G_1 e_1 - (G_1 + g) e_2 = I_S$

② $-G_1 e_1 + (G_1 + G_2 + G_3) e_2 - G_3 e_3 = 0$

③ $-G_3 e_2 + G_3 e_3 - I + g e_2 = 0$

① $e_1 - 5 e_2 = 6$

② $-e_1 + 6 e_2 - 3 e_3 = 0$

③ $-3 e_2 + 3 e_3 - I + 4 e_2 = 0$

$\Rightarrow e_3 = V = -1 + \frac{1}{6} I$