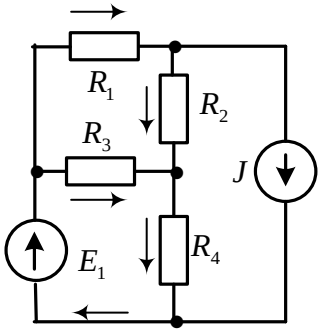
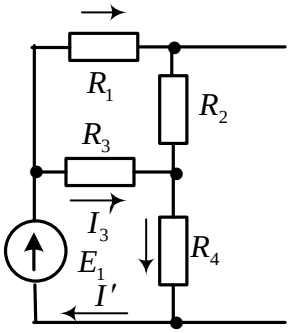
Exemplo sobreposição

Calcular as correntes assinaladas no circuito dado utilizando o método de sobreposição.

$E_1 = 100\,V\ ;\ J = 6\ A;\ R_1 = 2{,}5\,\Omega$

$R_2 = 10\,\Omega\ ;\ R_3 = 40\,\Omega\ ;\ R_4 = 20\,\Omega$

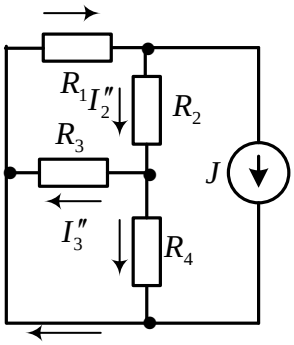




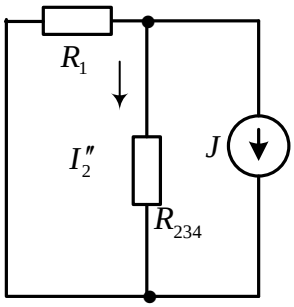
$$R_{EQ1} = R_4 + \frac{R_3\left(R_1 + R_2\right)}{R_3 + R_1 + R_2} = 29{,}52\Omega$$

$$I' = \frac{E_1}{R_{EQ1}} = 3{,}38\ A = I_4'\quad I_3' = I'\frac{R_1 + R_2}{R_1 + R_2 + R_3} = 0{,}8\ A$$

$$I_1' = I_2' = I' - I_3' = 2{,}58\ A$$



$$R_{234} = R_2 + \frac{R_3 R_4}{R_3 + R_4} = 23{,}33\,\Omega$$



$$I_2'' = -\,J\,\frac{R_1}{R_1 + R_{234}} = -\,0{,}58\ A\quad I_3'' = I_2''\frac{R_4}{R_4 + R_3} = -0{,}19\ \ A$$

$$I_4'' = I_2''\frac{R_3}{R_4 + R_3} = -0{,}39\ \ A\quad I_1'' = I_2'' + J = 5{,}42\ \ A\quad I'' = I_4'' + J = 5{,}61\ A$$

$E_1 = 100\,V\ ;\ J = 6\ A;\ R_1 = 2{,}5\,\Omega$

$R_2 = 10\,\Omega\ ;\ R_3 = 40\,\Omega\ ;\ R_4 = 20\,\Omega$

$$I_3 = I_3' - I_3'' = 0{,}99\ A\quad I_1 = I_1' + I_1'' = 8\ A\quad I_2 = I_2' + I_2'' = 2\ A\quad I_4 = I_4' + I_4'' = 2{,}99\ A$$

$$I = I' + I'' = 8{,}99\ A$$