

$$R_{tot} = \frac{6k\Omega \cdot 3k\Omega}{6k\Omega + 3k\Omega} = 2k\Omega$$

$$RC = 2k\Omega \cdot 100\mu F = 0,2$$

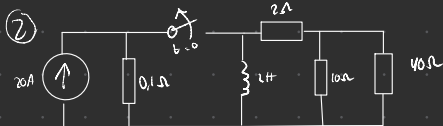
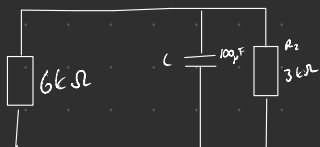
$$V(0) = 12 \cdot \frac{3000\Omega}{4000} = 9$$

$$V(\infty) = 0V$$

$$v(t) = 9e^{-\frac{t}{0,2}}$$

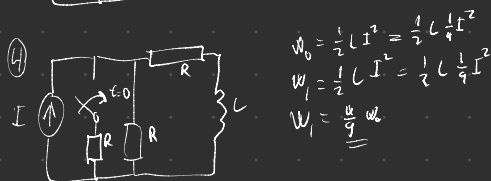
$$i(t) = \frac{9e^{-\frac{t}{0,2}}}{3000\Omega} = \frac{3}{1000}e^{-\frac{t}{0,2}}mA$$

12V



a) 20A  
b) 0A  
c)  $\tau = \frac{2}{\frac{10+40}{50} + 2} = \frac{2}{\frac{10 \cdot 40}{50} + 2} = 0,2s$   
d)  $i(t) = 20e^{-\frac{t}{0,2}}A$   
e)  $i_{L(0)} = 20e^{-\frac{0}{0,2}} \cdot \frac{10}{10+40} = 4e^{-\frac{t}{0,2}}A$   
f)  $E = \frac{1}{2}LI^2 = \frac{1}{2} \cdot 2 \cdot (10)^2 = 100$   
g)  $I = \sqrt{200} \approx 14,1A$   
 $20e^{-5t} = 14,1$   
 $t = -\frac{\ln(\frac{14,1}{20})}{5} = 0,07s$

$$R_{tot} = R + \frac{R \cdot R}{R + R} = R + \frac{R^2}{2R} = \frac{3R}{2}$$



⑤  $\frac{20V}{2\Omega} = 10A$

$$C_{eq} = 10A \cdot \frac{C_1}{C_1 + C_2}$$



$$R_{\text{out}} = R_m \parallel R_L \parallel R_F = R_m + \frac{R_L \cdot R_F}{R_L + R_F}$$

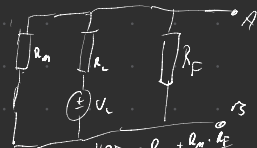
$$I = \frac{V_m}{R_m + \frac{R_L \cdot R_F}{R_L + R_F}} \cdot \frac{R_L + R_F}{R_L + R_F} = \frac{V_m (R_L + R_F)}{R_m R_L + R_m R_F + R_L R_F}$$

$$I_{R_F} = \frac{V_m (R_L + R_F)}{R_m R_L + R_m R_F + R_L R_F} \cdot \frac{R_L}{R_L + R_F}$$

$$V_{R_F} = \frac{R_L V_m}{R_m R_L + R_m R_F + R_L R_F} \cdot R_F$$

$$V_{\text{out}} = \frac{R_L V_m R_F}{R_m R_L + R_m R_F + R_L R_F} + \frac{R_m V_L R_F}{R_m R_L + R_m R_F + R_L R_F} = \frac{R_F}{R_m R_L + R_m R_F + R_L R_F} (R_L V_L + R_L V_m)$$

c)



$$R_{\text{out}} = R_L \parallel R_m \parallel R_F = R_L + \frac{R_m \cdot R_F}{R_m + R_F}$$

$$I = \frac{V_L}{R_L + \frac{R_m \cdot R_F}{R_m + R_F}} \cdot \frac{R_m + R_F}{R_m + R_F} = \frac{V_L (R_m + R_F)}{R_m R_L + R_m R_F + R_L R_F}$$

$$I_{R_F} = \frac{V_L (R_m + R_F)}{R_m R_L + R_m R_F + R_L R_F} \cdot \frac{R_m}{R_m + R_F}$$

$$V_{R_F} = \frac{R_m V_L}{R_m R_L + R_m R_F + R_L R_F} \cdot R_F$$