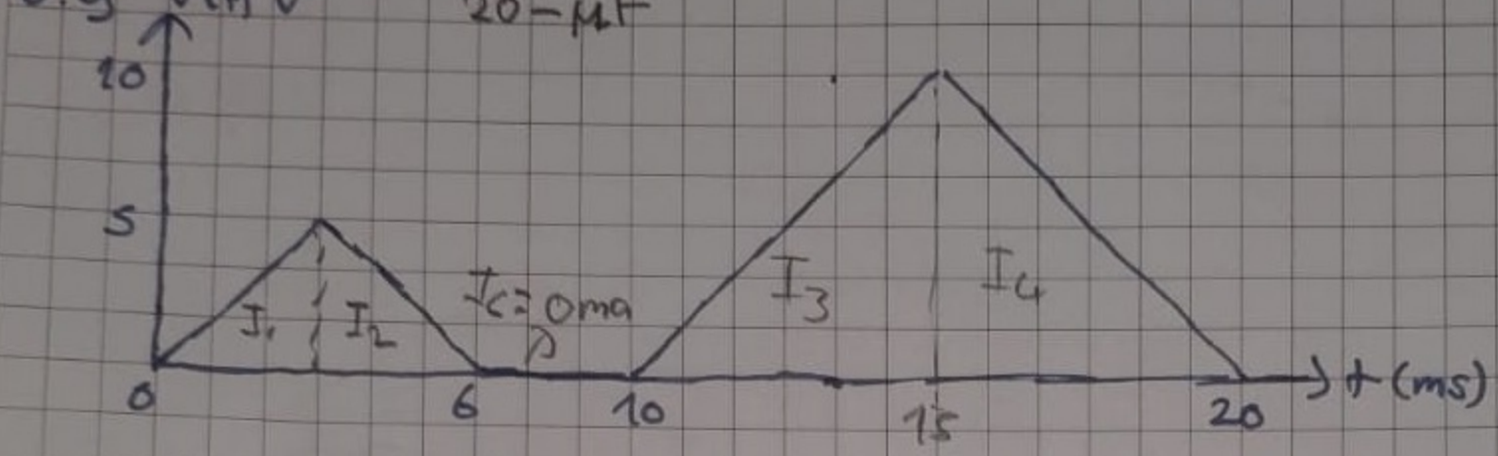
6.g



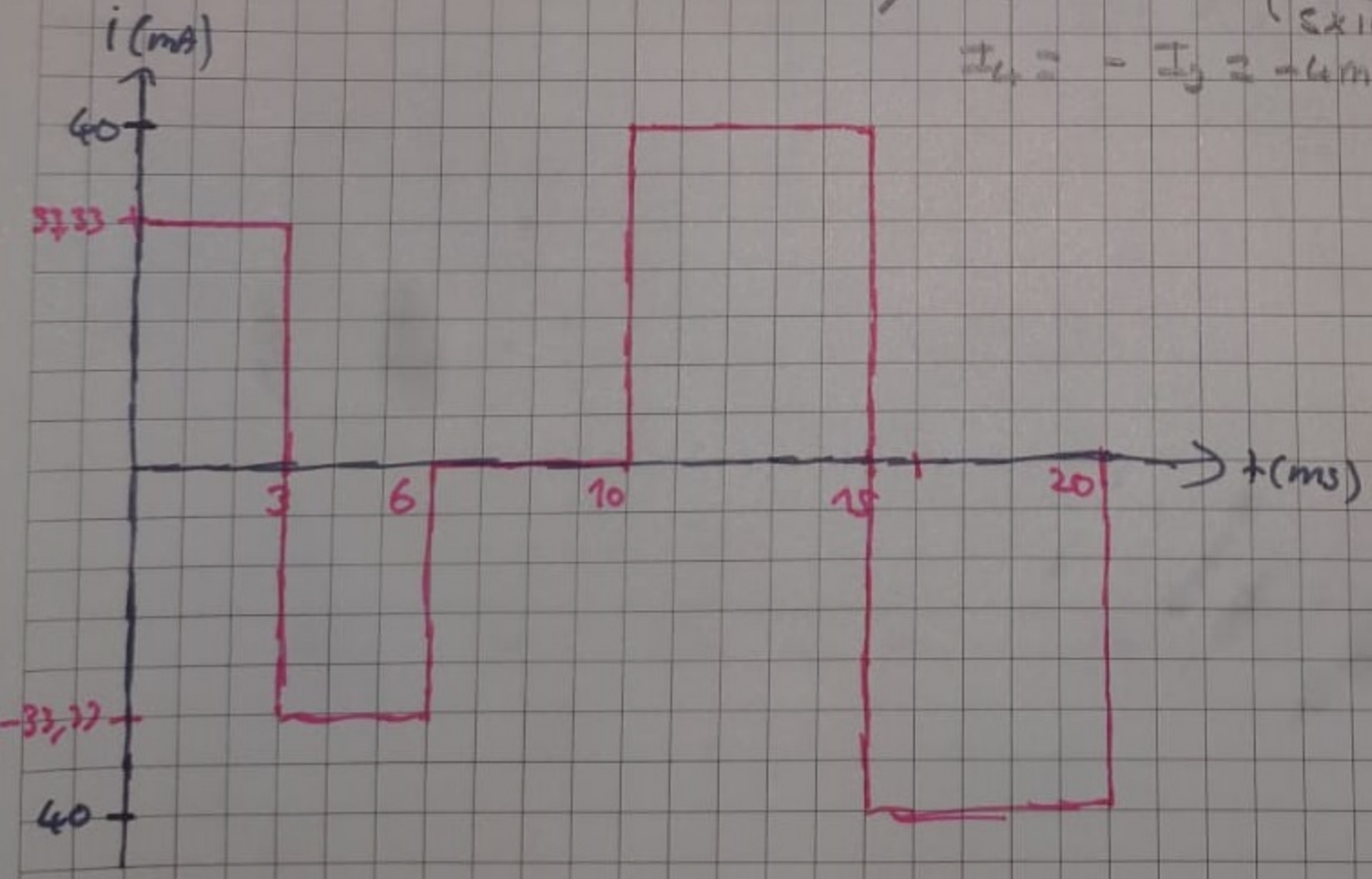
$i = C \times \left(\frac{dv}{dt}\right)$

$I_1 = 20.10^{-6} \times \left(\frac{5V}{3 \times 10^{-3} \text{ saniye}}\right) = 0,033\ A = 33,33\ mA$

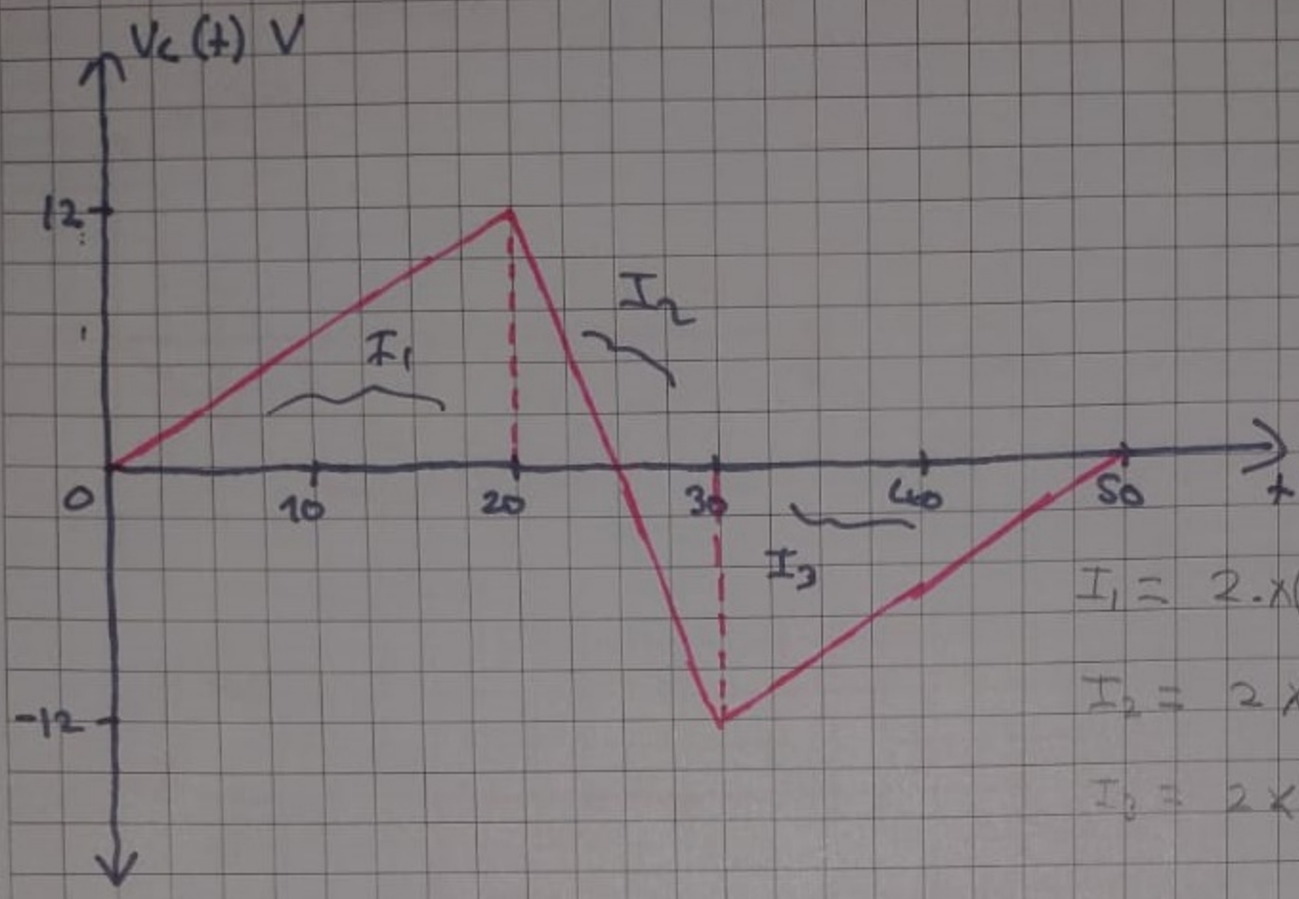
$I_2 = -I_1 = -33,33\ mA$

$I_c = 0 mA$, $I_3 = 20.10^{-6} \times \left(\frac{10}{5 \times 10^{-3} s}\right) = 0,04\ A = 4\ mA$

$I_4 = -I_3 = -4 mA$



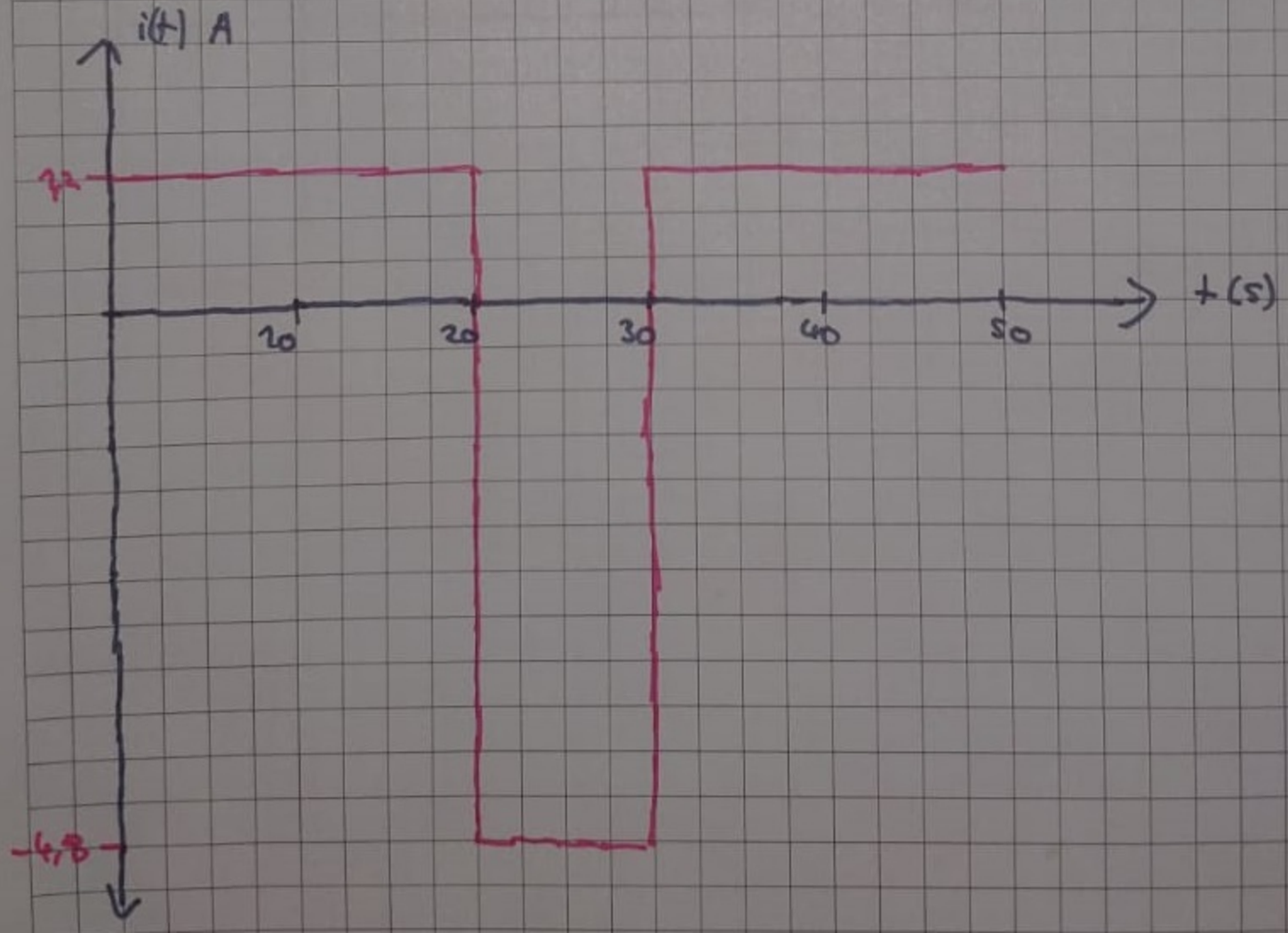
6.15 2-F



$I_1 = 2 \cdot \left(\frac{12}{20}\right) = 1,2A$

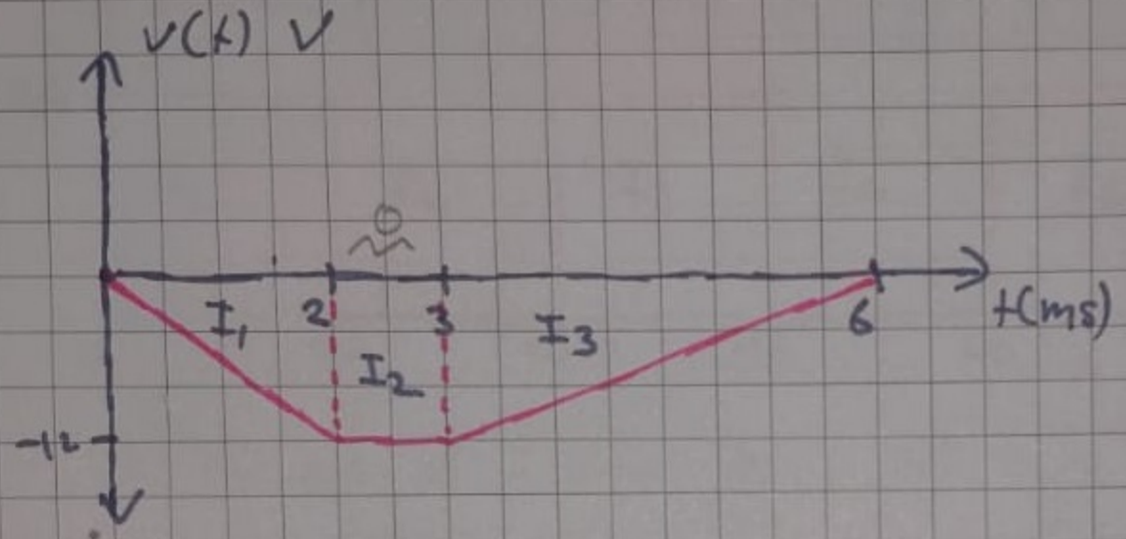
$I_2 = 2 \times \left(\frac{-24}{10}\right) = -4,8A$

$I_3 = 2 \times \left(\frac{12}{20}\right) = 1,2A$



6.16

2-μF



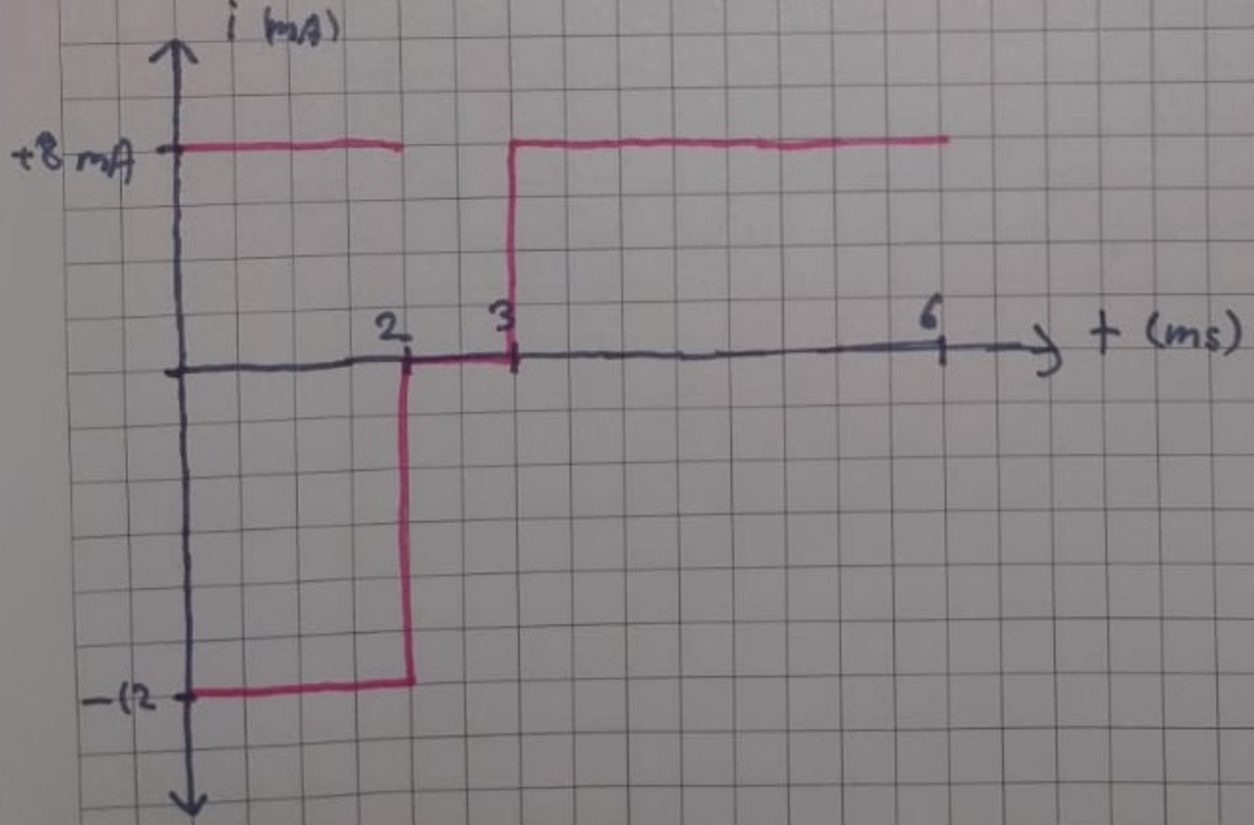
$I_1 = 2\times10^{-6} \times \left(\frac{-12}{2.10^{-3}}\right) = -0,012A = -12mA$

$I_1 = -12\,mA$

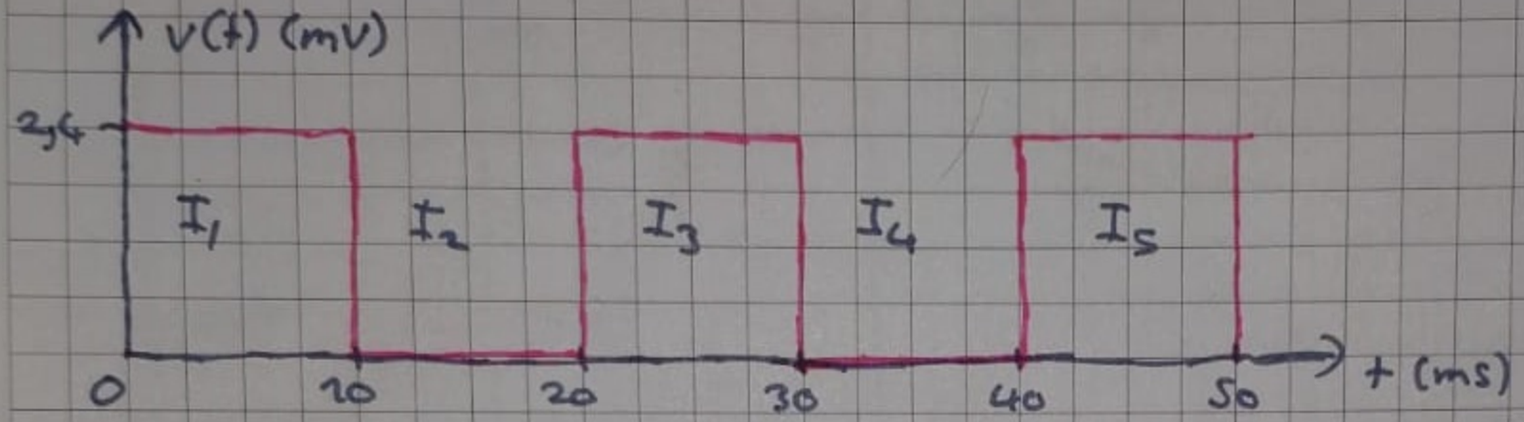
$I_2 = 0\,mA$

$I_3 = 2\times10^{-6} \times \left(\frac{+12}{3.10^{-3}}\right) = +0,008\,mA$

$I_3 = +8mA$



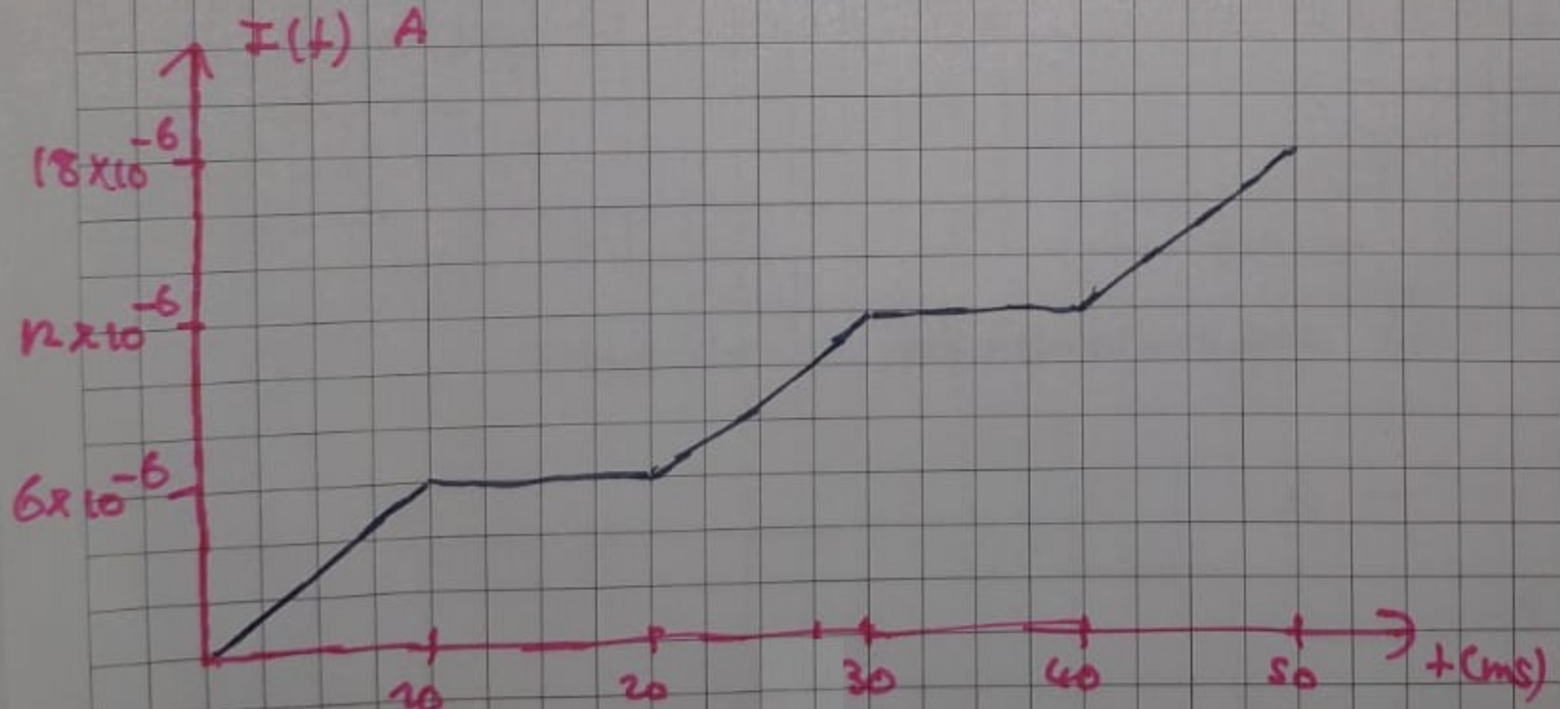
6.28 4-H inductor $v(t) = 0, t<0$



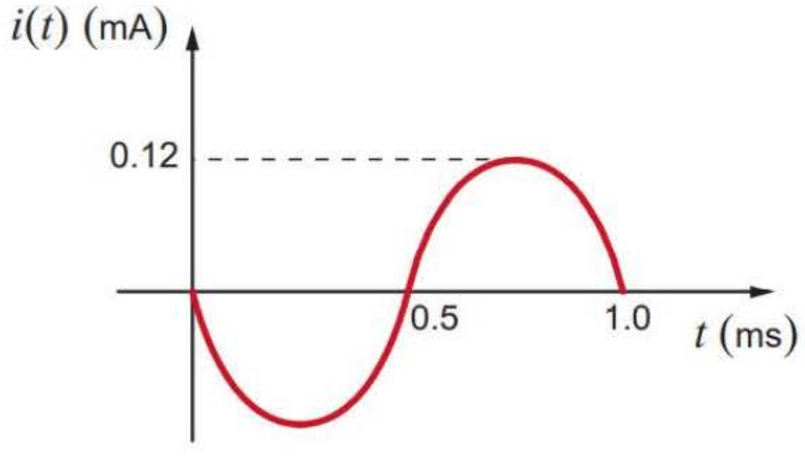
$$V = L \cdot \frac{di}{dt}$$

$I_1 \Rightarrow 2,4 \cdot 10^{-3} = 4(H) \times \left(\frac{di_1}{10 \cdot 10^{-3}}\right) \Rightarrow 6 \times 10^{-6} A = di_1$ $\quad I_2 \Rightarrow 0$

$I_3 \Rightarrow 2,4 \cdot 10^{-3} = 4 \times \left(\frac{di_3}{10 \cdot 10^{-3}}\right) \Rightarrow 6 \times 10^{-6} A = di_3$ $\quad I_4 = 0$, $I_5 = I_3 = I_1$



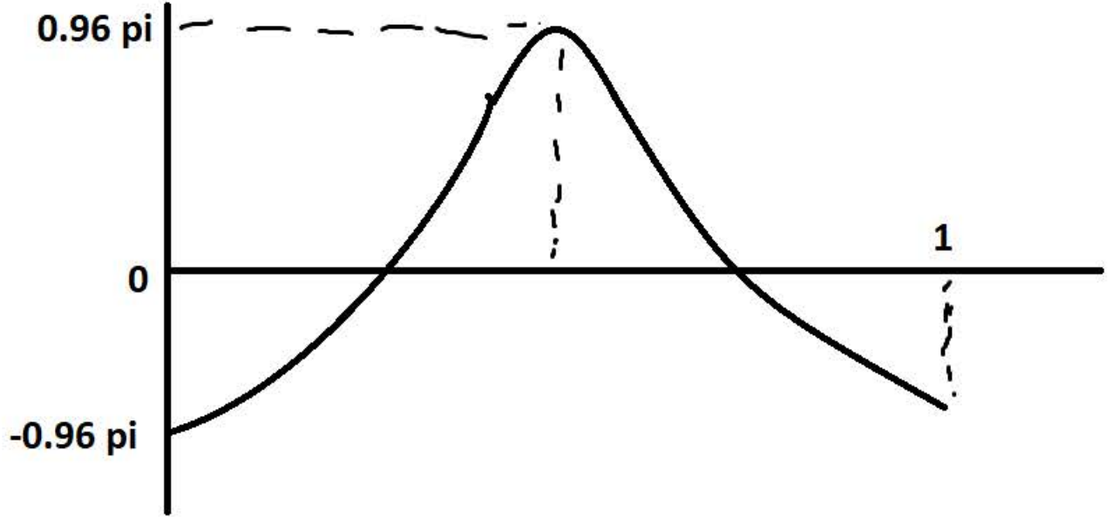
6.38 The current in a 4-mH inductor is given by the waveform in Fig. P6.38. Plot the voltage across the inductor.



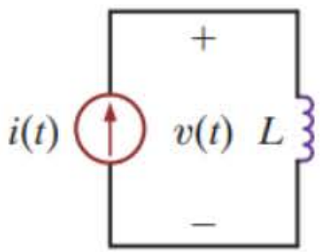
I(t) = Im.sin(w.t) -sin grafiği olduğu için sin değerini - alacağım
0.12 x -sin(2pi/1x10^-3 x t) mA
L.(di/dt) = V(t)

yerine yazar isek
4x10^-3 (-0.12 x 10^-3 x cos((2pi x t)/10^-3) x 2pi/10^-3)
cos -1 ile 1 arasındadır 10^-3 ler birbirlerini götürür geriye

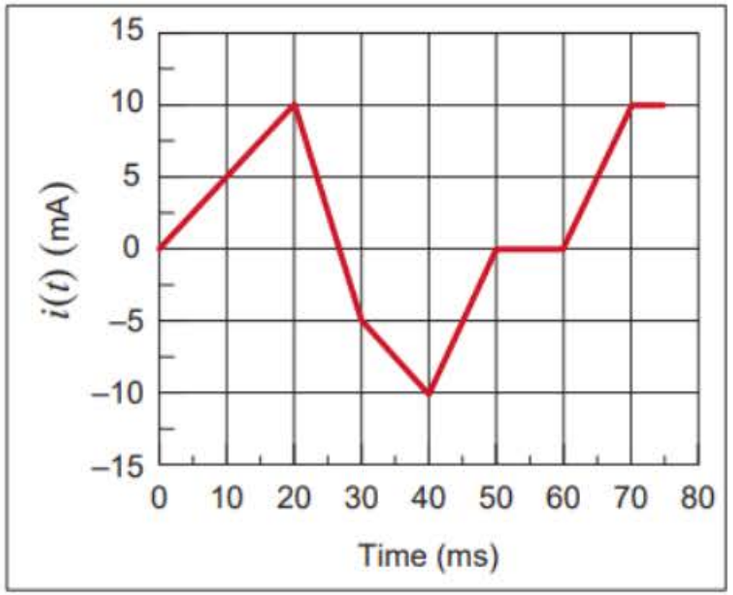
V(t) = -0.96pi x 10^-3 x cos((2pi x t)/10^-3) kalır
t değerim 0 ile 1x10^-3 saniye arasında yani şöyle bir grafik çıkacak



6.42 The inductor in Fig. P6.42a is 4.7 μH with a tolerance of 20%. Given the current waveform in Fig. 6.42b, graph the voltage $v(t)$ for the minimum and maximum inductor values.



(a)



(b)

%20 toleransı olduğu için
min değeri = 4.7 - 4.7 x(20/100) , max değeri = 4.7 + 4.7 x (20/100) olur.
min=3,76 , max = 5,64 olur inductor değer aralığım böyle olacak
3,76< x <5,64

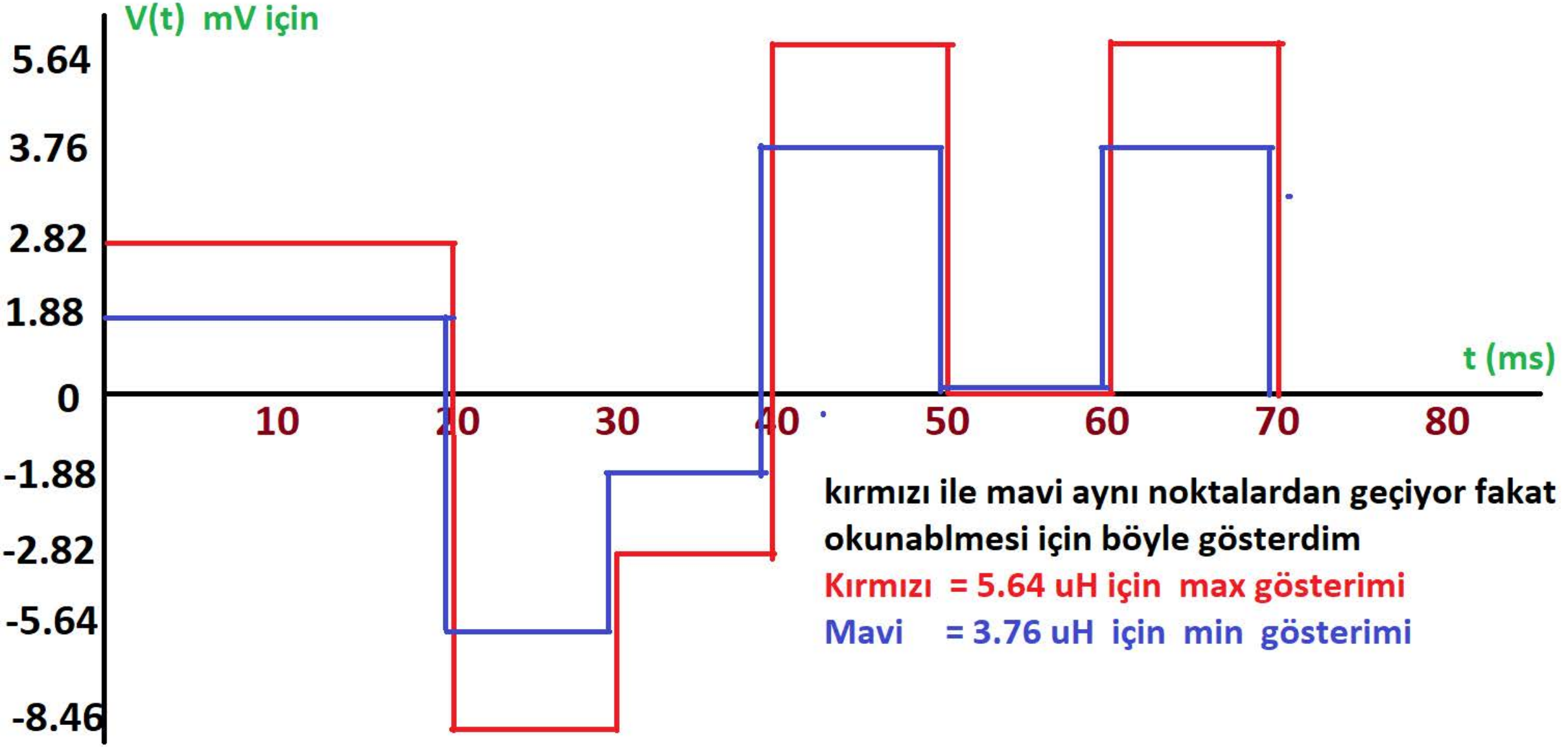
V(t)= Lx(di/dt) ye göre sürelere bakarsak :

inceleyeceğimiz süre aralıkları şöyle olacak 0-20 , 20-30 , 30-40 , 40-50 , 50-60 , 60-70
olacak akım ve süre değişimlerine göre ise L değerimizin max ve min halleriyle teker teker çarpacağız.
İlk önce ana değişim değerlerimi sırasıyla yazalım
0.5 , -1.5 , -0.5 , 1 , 0 , 1 gelir uH = H x 10^-6 olur. Fakat tam şekilde göstermek için uH formunda kullanacağız

min ve max değerleri için yazalım şimdi

Min değerleri için sırasıyla. İlkini örnek olarak göstereyim : 0.5 x 3,76 şeklinde
1.88 , -5.64 , -1.88 , 3.76 , 0 , 3.76
Max değerleri için
2.82 , -8.46 , -2.82 , 5.64 ,0 ,5.64 Grafiğe dökersek

6.42 Grafik hali



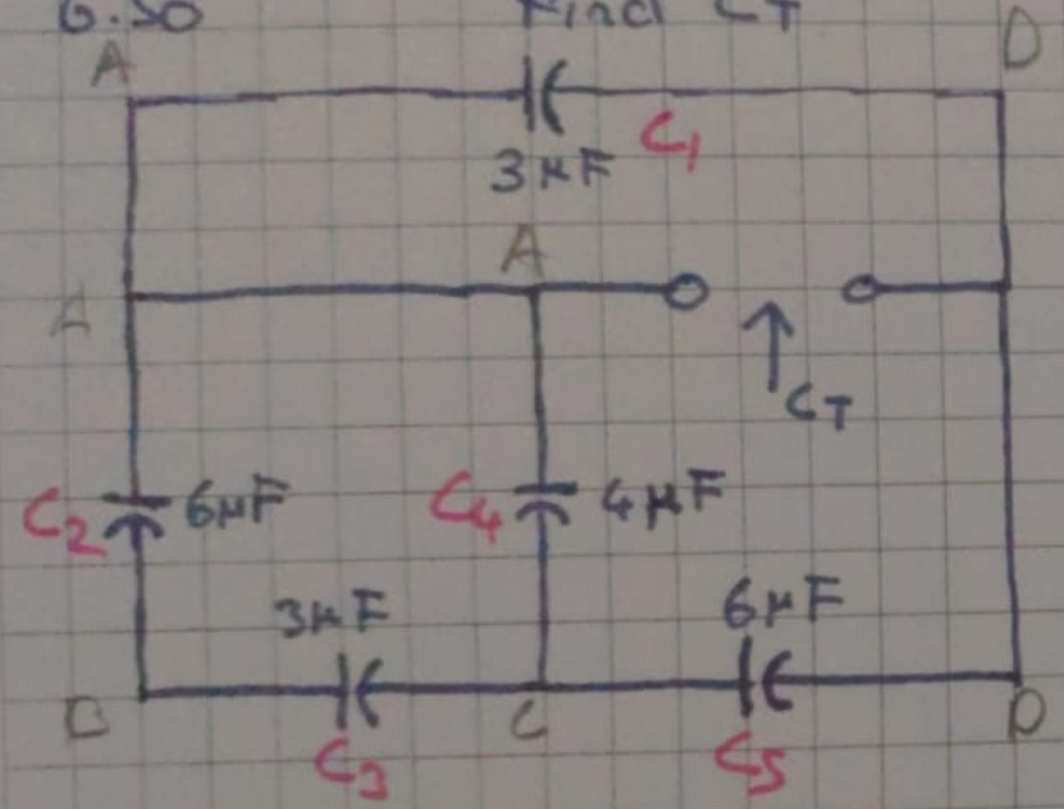
kırmızı ile mavi aynı noktalardan geçiyor fakat okunablmesi için böyle gösterdim

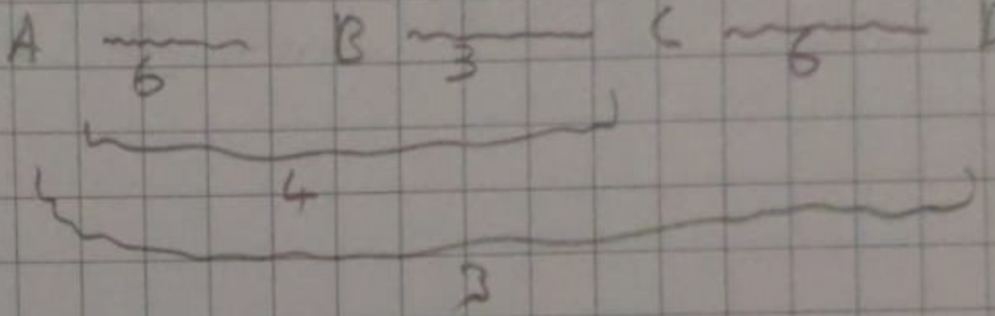
Kırmızı = 5.64 uH için max gösterimi

Mavi = 3.76 uH için min gösterimi

6.So

Find C_T





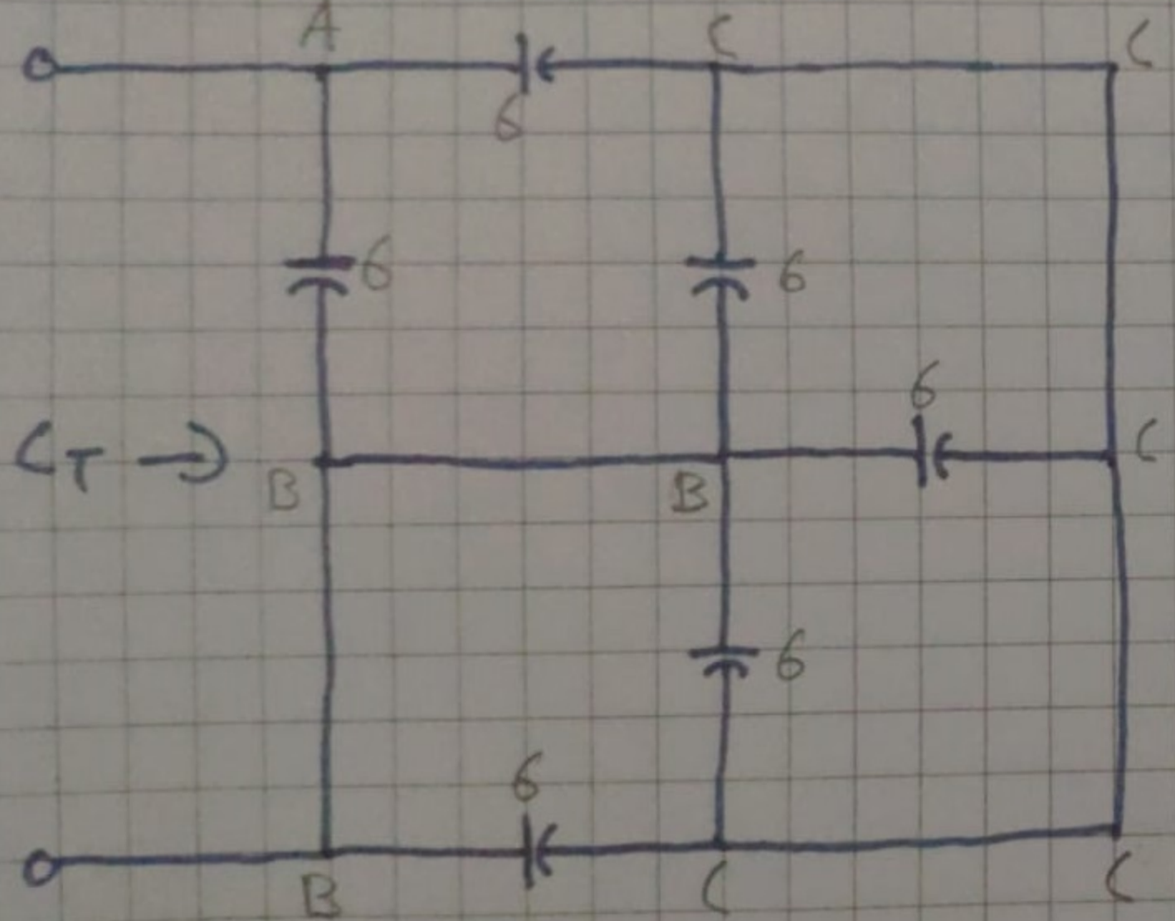
C_2 ile C_3 seri $= \frac{1}{6} + \frac{1}{3} = \frac{1}{C_a}$ $C_a = 2\mu F$

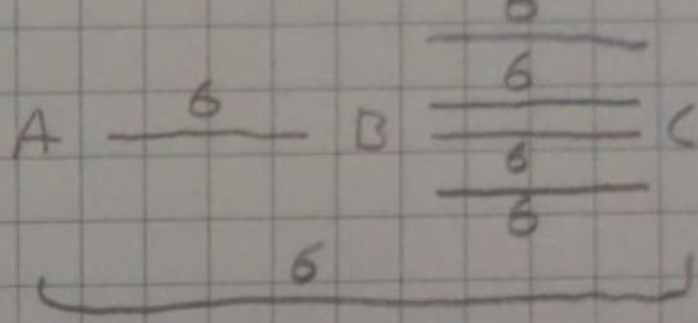
C_a ile C_4 paralel $= 2\mu F + 4\mu F = 6\mu F = C_b$

C_b ile C_5 seri $= \frac{1}{6} + \frac{1}{6} = \frac{1}{C_d} = C_d = 3\mu F$

C_d ile C_1 paralel $= 3+3 = 6\mu F$, $C_T = 6\mu F$

6.56 Find C_T all capacitors are 6 μF





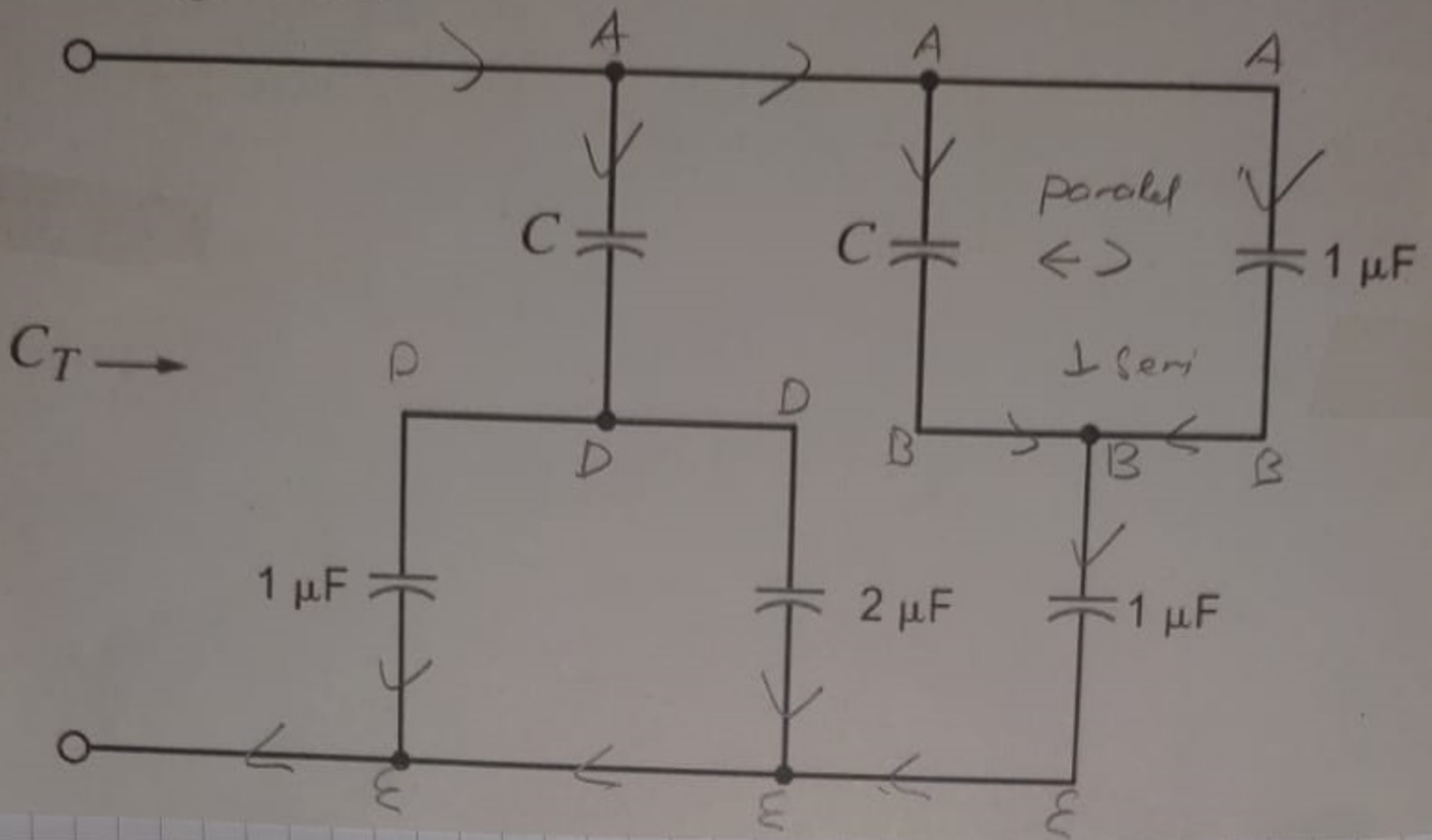
B-C arası paralel = 6+6+6+6 = 24 μF

A - (B-C) ile seri = $\frac{1}{6} + \frac{1}{24} = 4{,}8$ μF

4,8 ise A-C'ye paralel = 10,8 μF

C_T = 10,8 μF

6.65 Select the value of C to produce the desired total capacitance of $C_T = 1\ \mu F$ in the circuit in Fig. P6.65.



A-B birbirine paralel B-E ye seri

$C_{ab} = C+1$ $\quad C_{be} = 1$ $\quad \frac{1}{C+1} + 1 = \frac{1}{C_{ae}} \quad \frac{C+2}{C+1} = \frac{1}{C_{ae}}$

$C_{ae} = \frac{C+1}{C+2}$

D-E ler birbirine paralel A-B ye seri

$C_{DE} = 1+2 = 3$ $\quad C_{AB} = C$ $\quad \frac{1}{3} + \frac{1}{C} = \frac{1}{C_{AE}}$

$C_{AE} = \frac{3C}{C+3}$

C_{AE} ler birbirlerine paralel bu işlemin sonucunda C_T ye eşit

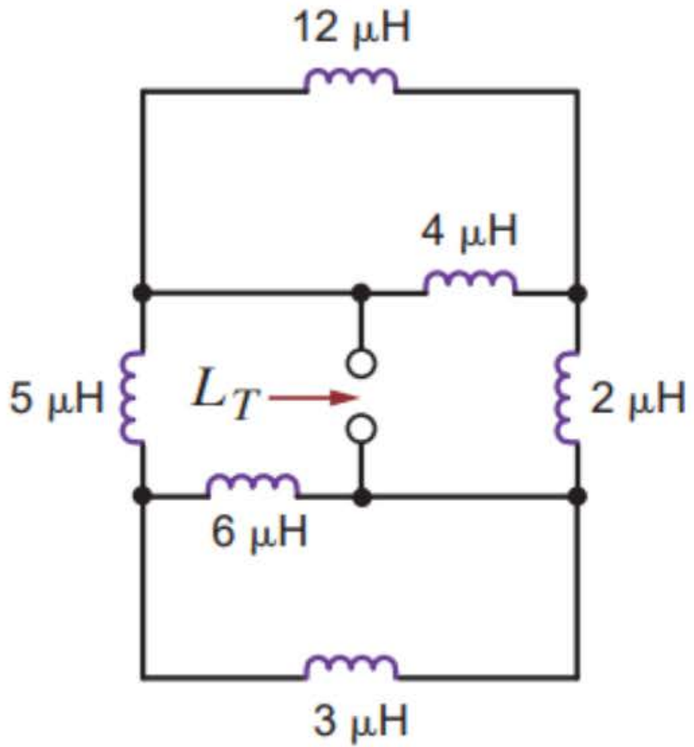
$$\frac{3C}{C+3} + \frac{C+1}{C+2} = 1 \Rightarrow \frac{3C^2+6C+C^2+C+3C+3}{C^2+5C+6} = 1$$

$4C^2+10C+3 = C^2+5C+6$

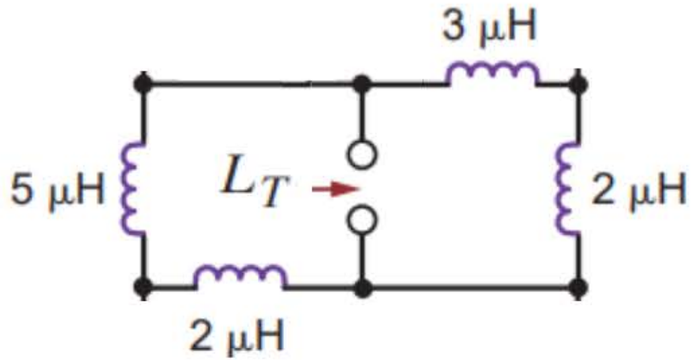
$3C^2+5C-3 = 0$

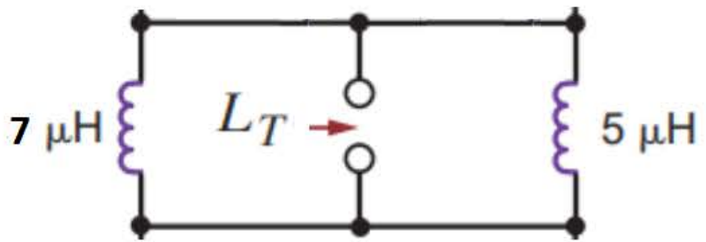
$$C = \frac{-5+\sqrt{61}}{6}$$

6.72 Find L_T in the circuit in Fig. P6.72.



12 ile 4 birbirlerine paraleller o yüzden 3 geldi
6 ile de 3 birbirlerine paraleller o yüzden oradan da 2 geldi

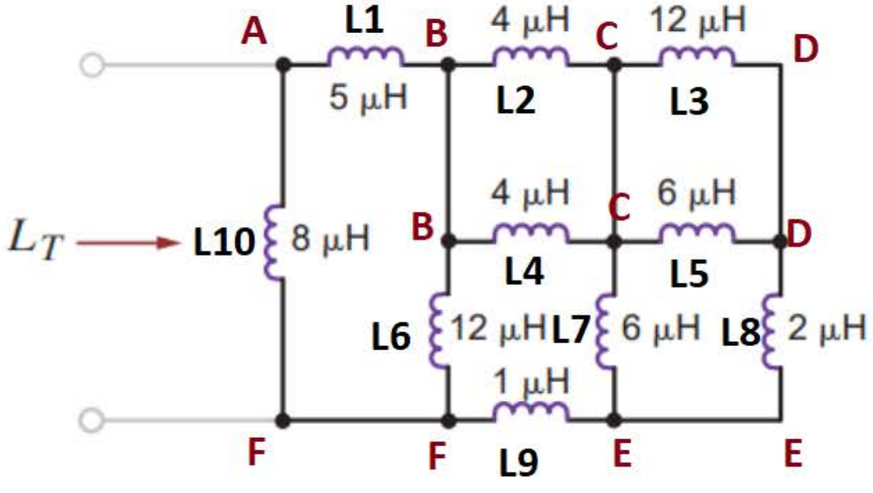


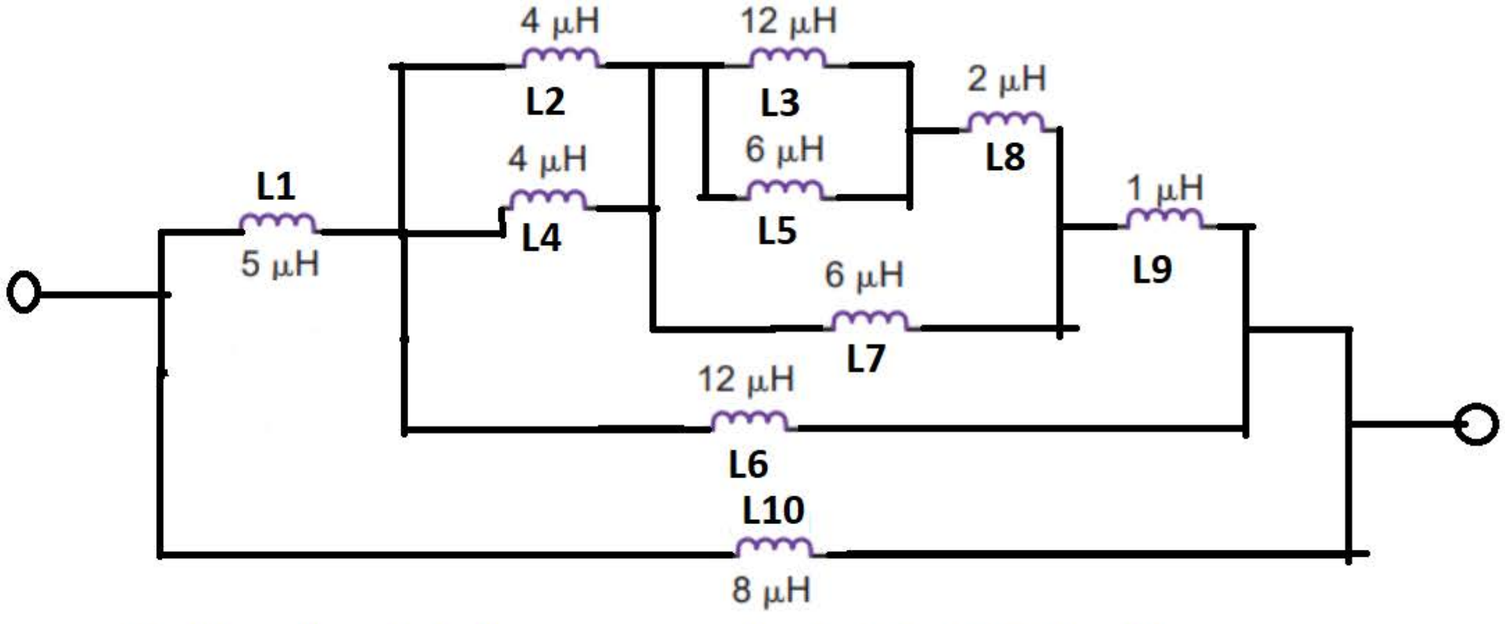


$$L_T = \frac{L_1 \times L_2}{L_1 + L_2}$$

olduğu için 5x7/(12)
35/12=
2.916666666666667 μH

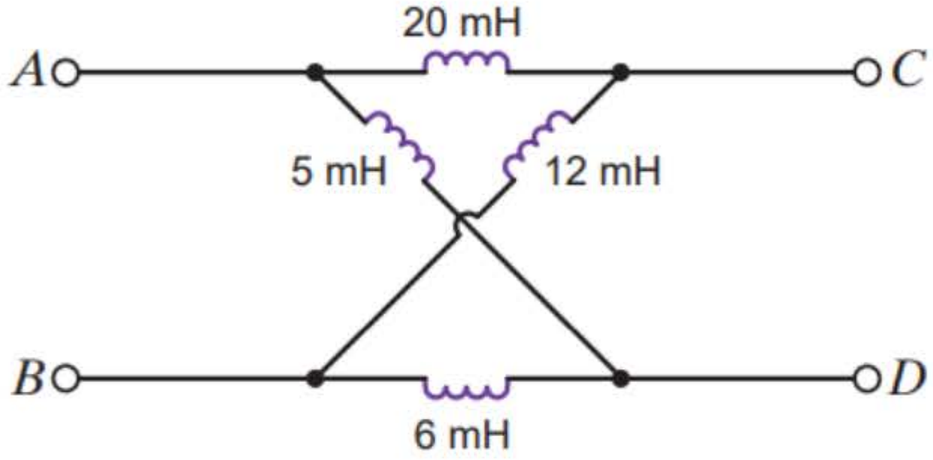
6.74 Find L_T in the circuit in Fig. P6.74.



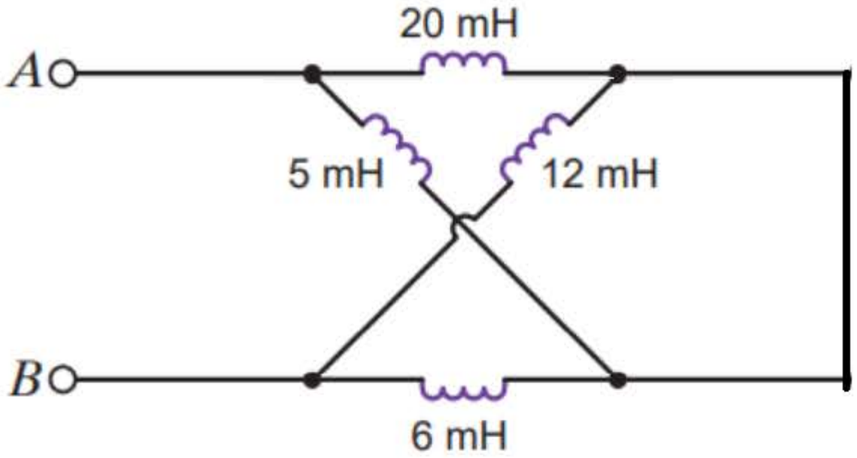


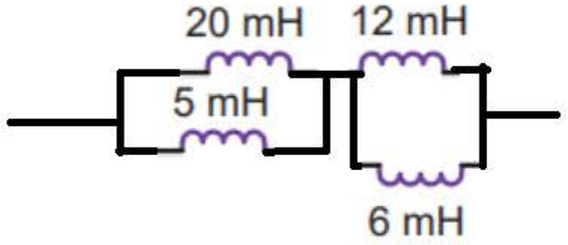
Bu düzenlenmiş halin sonucuna göre ise LT=4,23 olacaktır.

6.79 Given the network shown in Fig. P6.79, find (a) the equivalent inductance at terminals *A*-*B* with terminals *C*-*D* short circuited, and (b) the equivalent inductance at terminals *C*-*D* with terminals *A*-*B* open circuited.



A)

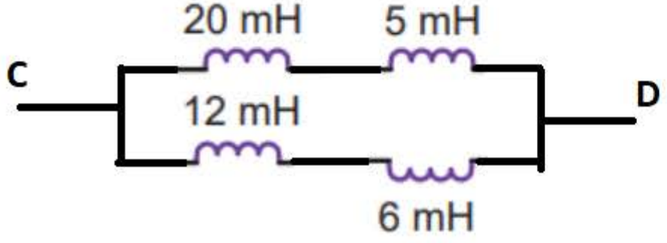




Buradan 8 mH geldi

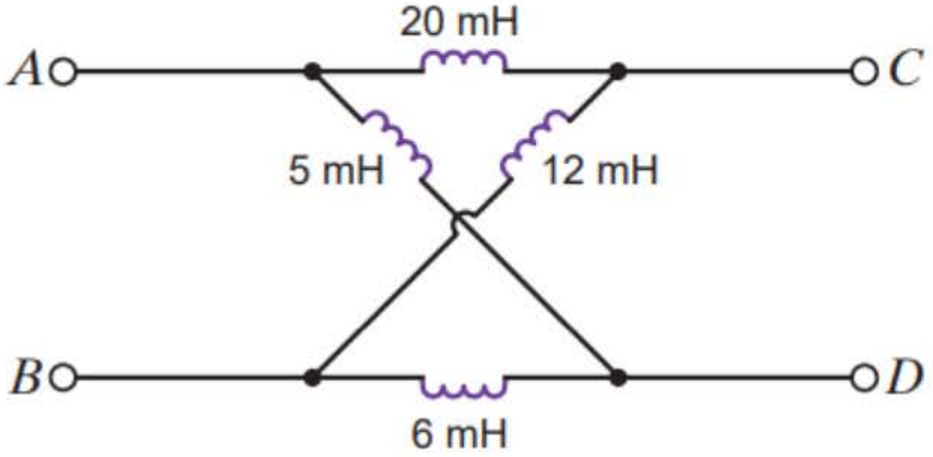
B) ÇÖZÜM :

A-B açık devre olduğu için akım gitmeyecek C den çıkan akım şöyle yol alacaktır. 20 ile 12 paralel olacaktır. 12 den geçen akım 6 ile seri olacaktır. 20 den geçen akım 5 ile seri 6 ile ise paralel olacaktır yani:



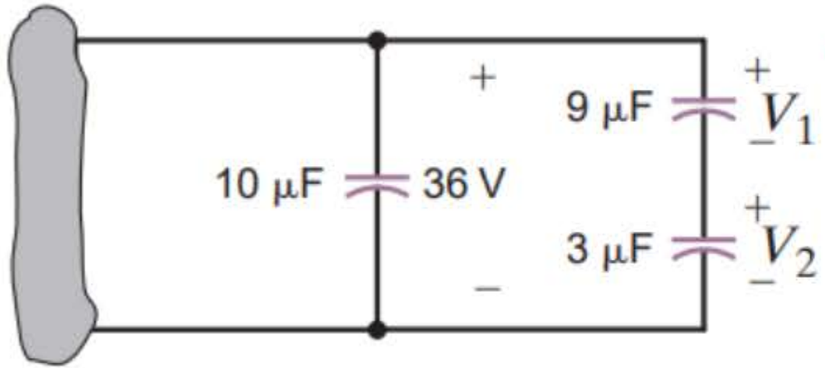
10.46511627906977 mH gelir buradan da

B)



6 .86 If the capacitors in the circuit in Fig. P6.86 have been connected for some time and have reached their present values, (a) calculate the voltages V_1 and V_2 and (b) determine the total energy stored in the capacitors.

$$i_c(t) = C\frac{dV_c}{dt}$$



A) Q=C1xV1 V1=Q/C1 seri olduklarında 1/C1 olacağı için V değerleri seri olduğu zaman direk toplayabilirim kanuna göre paralel kollara aynı volt düşeceği için

V1+V2=36V olur Q değerleri eşit olduğu için

C1xV1 = C2xV2 düzenlersek

V1=36-V2

$9x10^{-6}x(36-V2) = 3x10^{-6}xV2$ olur bunu da düzenlersek

108 - 3V2 = V2 , 4V2= 108 , V2 = 27 , V1 = 9 geldi.

B) V1 ve V2 yi biliyoruz toplam enerji formülü

$$U_C = \frac{1}{2}CV^2$$

$1/2[(10 x10^{-6} x1296) + (9x10^{-6} x81) + (3x10^{-6} x 729)]$

bu ise $w = 7.938 \times 10^{-6}$ gelir.