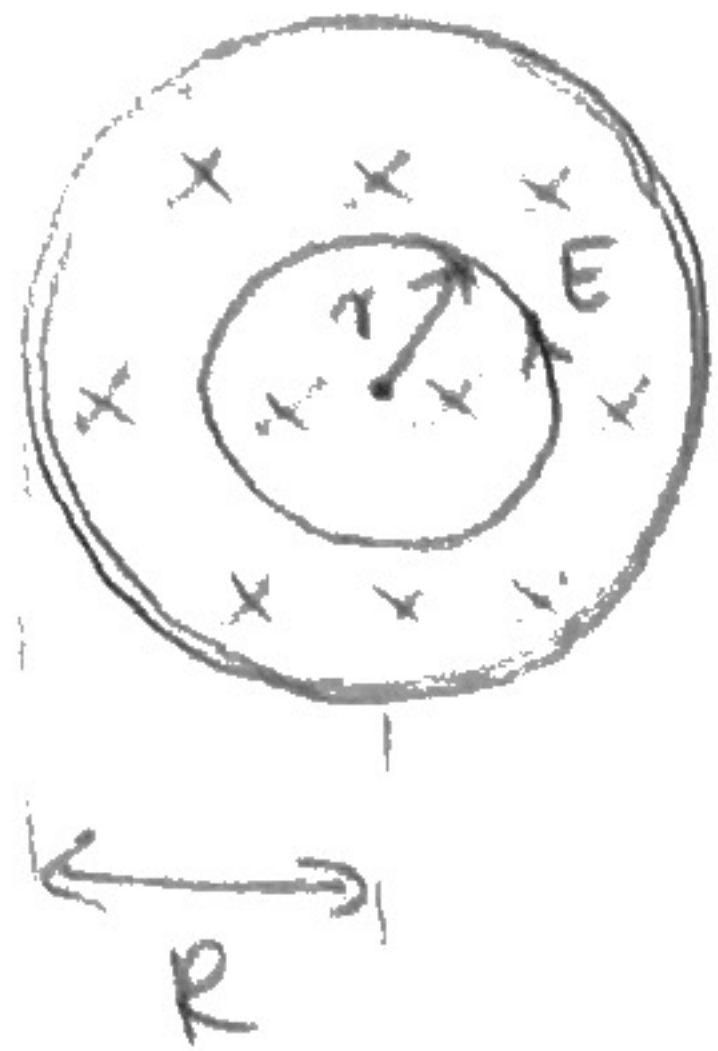


Megajárolt jegyes ZH.

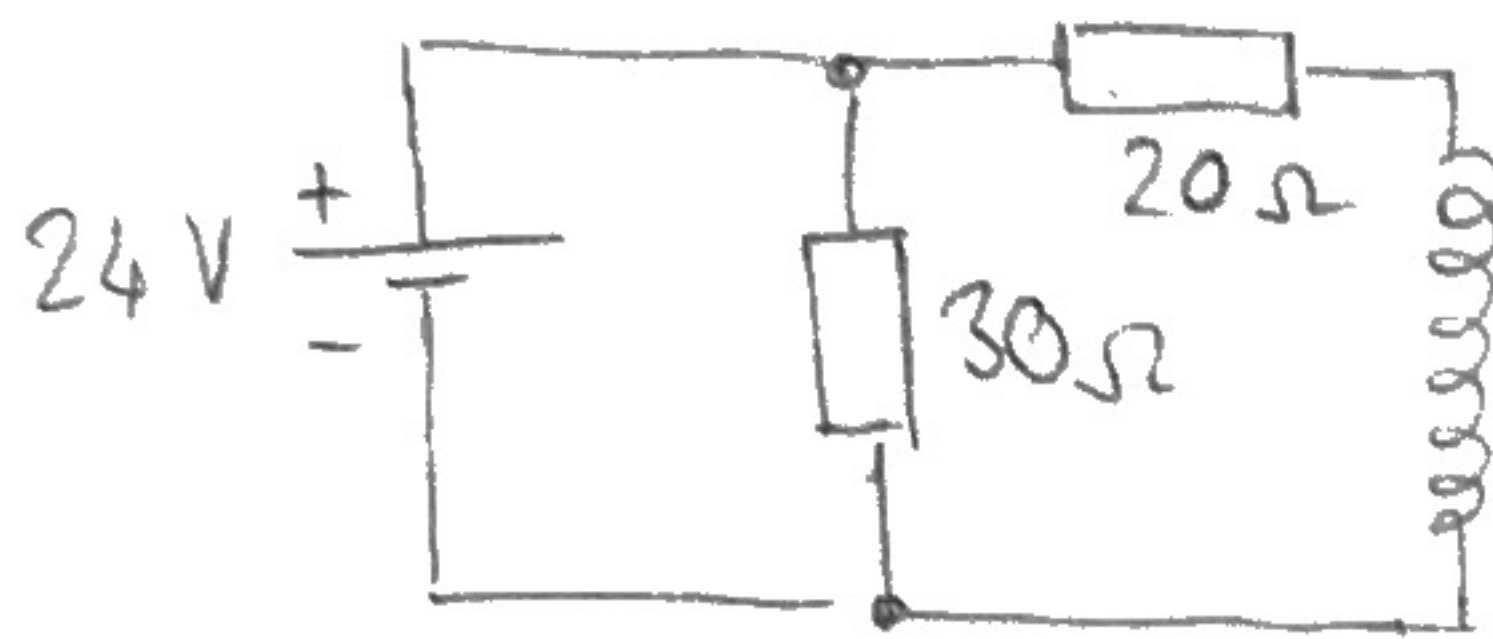
1.)



$$\underbrace{E \cdot 2\pi r}_{U_i} = \underbrace{\frac{d}{dt} (B_0 + \alpha t) \cdot \pi r^2}_{\frac{d\Phi}{dt}} \quad \text{(C)}$$

$$E(r) = \frac{\alpha}{2} r = \frac{0,2}{2} \cdot 0,02 = 0,001 \text{ (V/m)}$$

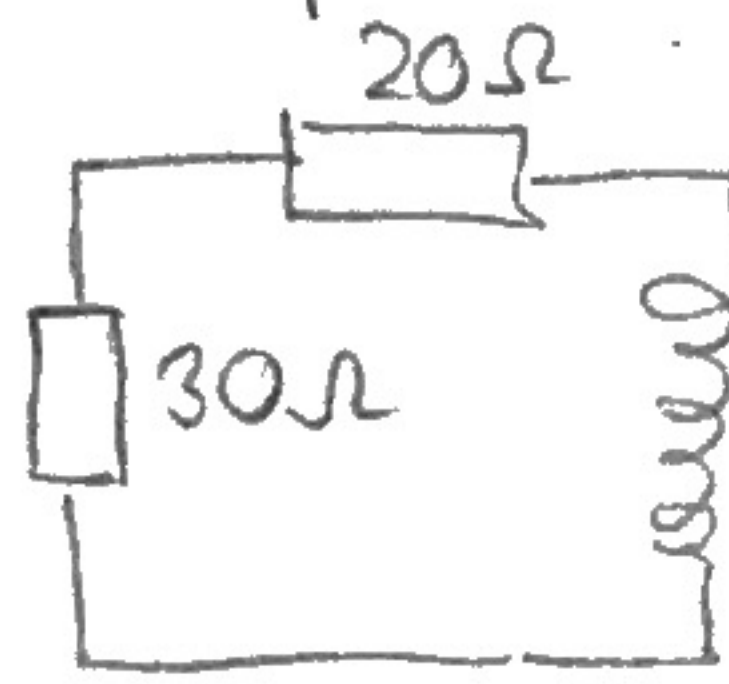
2.) A kapcsoló zárva:



$$I = \frac{24 \text{ V}}{20 \Omega} = 1,2 \text{ A}$$

(A)

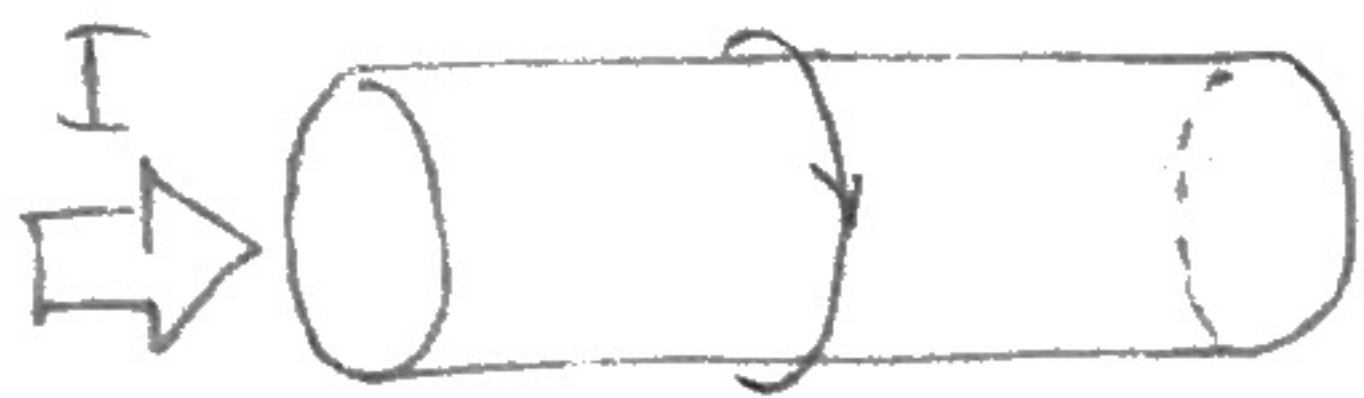
A kapcsoló nyitása után:



$$U_i = 50 \Omega \cdot 1,2 \text{ A}$$

$$U_i = 60 \text{ V}$$

3.)



$$\frac{R}{l} = \frac{\rho}{\pi r^2} = 20,8 \text{ m}\Omega$$

$$B = \frac{\mu_0 I}{2\pi r}$$

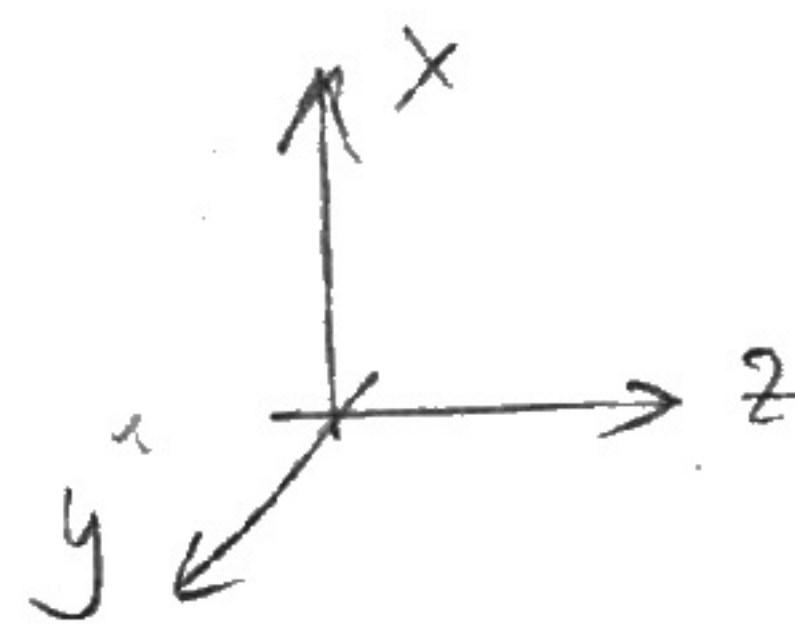
$$E = \rho \cdot \frac{I}{\pi r^2}$$

$$|S| = \frac{1}{\mu_0} EB = \frac{I \rho I}{2\pi r \pi r^2}$$

$$|S| = \frac{I^2}{2\pi r} \cdot \frac{\rho}{l} = 662 \frac{\text{W}}{\text{m}^2} \quad \text{(B)}$$

4.) $\underline{E}(x,t) = 9 \underline{e}_y \sin(kx - \omega t)$

$\underline{B}(x,t) = 3 \cdot 10^{-8} \underline{e}_z \sin(kx - \omega t)$

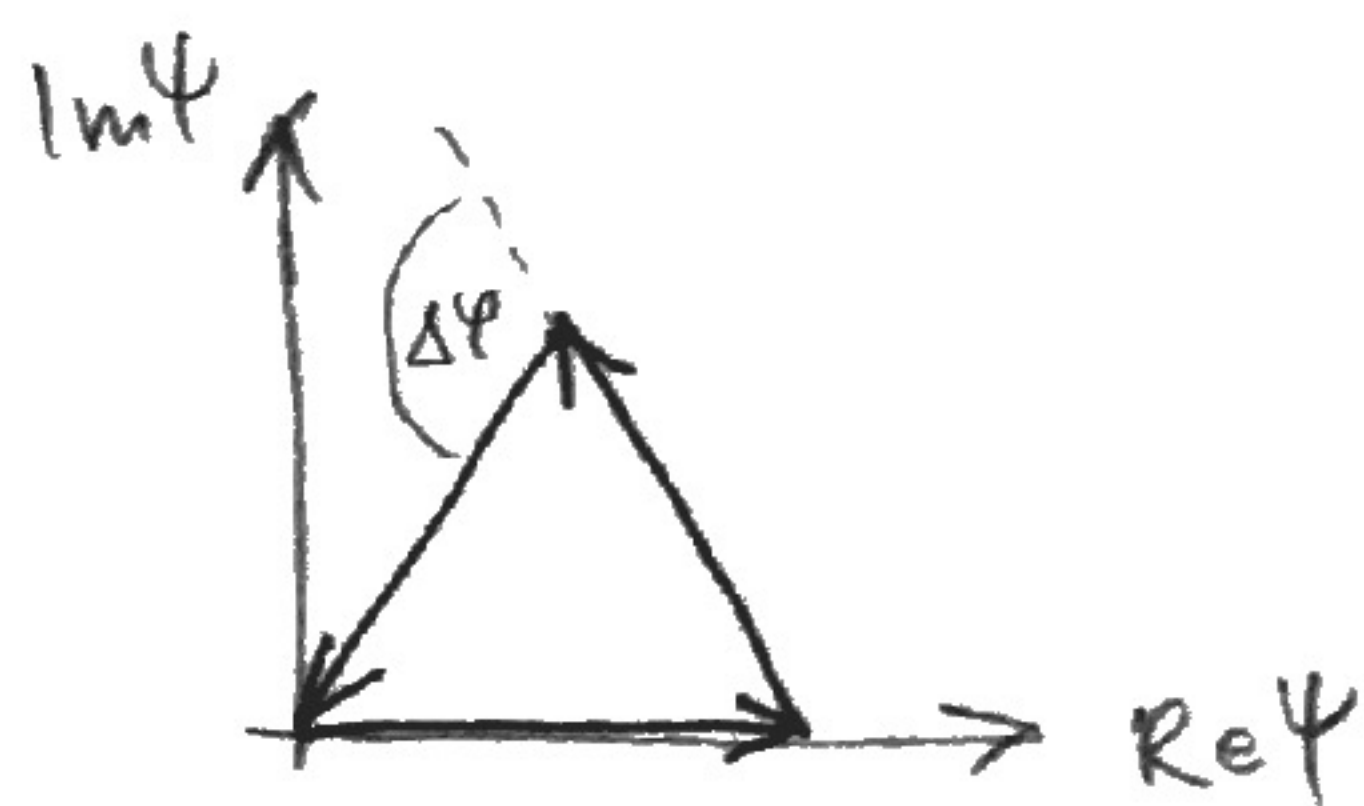


(D)

5.) $\frac{2\pi}{\lambda} \cdot c = \omega \rightarrow \lambda = \frac{2\pi c}{\omega} = 1,88 \mu\text{m} = 1885 \text{ nm}$ (A)

6.) Az elektromos térerősség: $E' = E_0 \cos \varphi \cdot \cos(90^\circ - \varphi) = E_0 \cos \varphi \sin \varphi$,
az intenzitás: $I' = I_0 \cos^2 \varphi \sin^2 \varphi = \frac{1}{4} I_0 \sin^2(2\varphi) = 0,103 I_0$ (C)

7.)



$$\Delta \varphi = \frac{2\pi}{3}$$

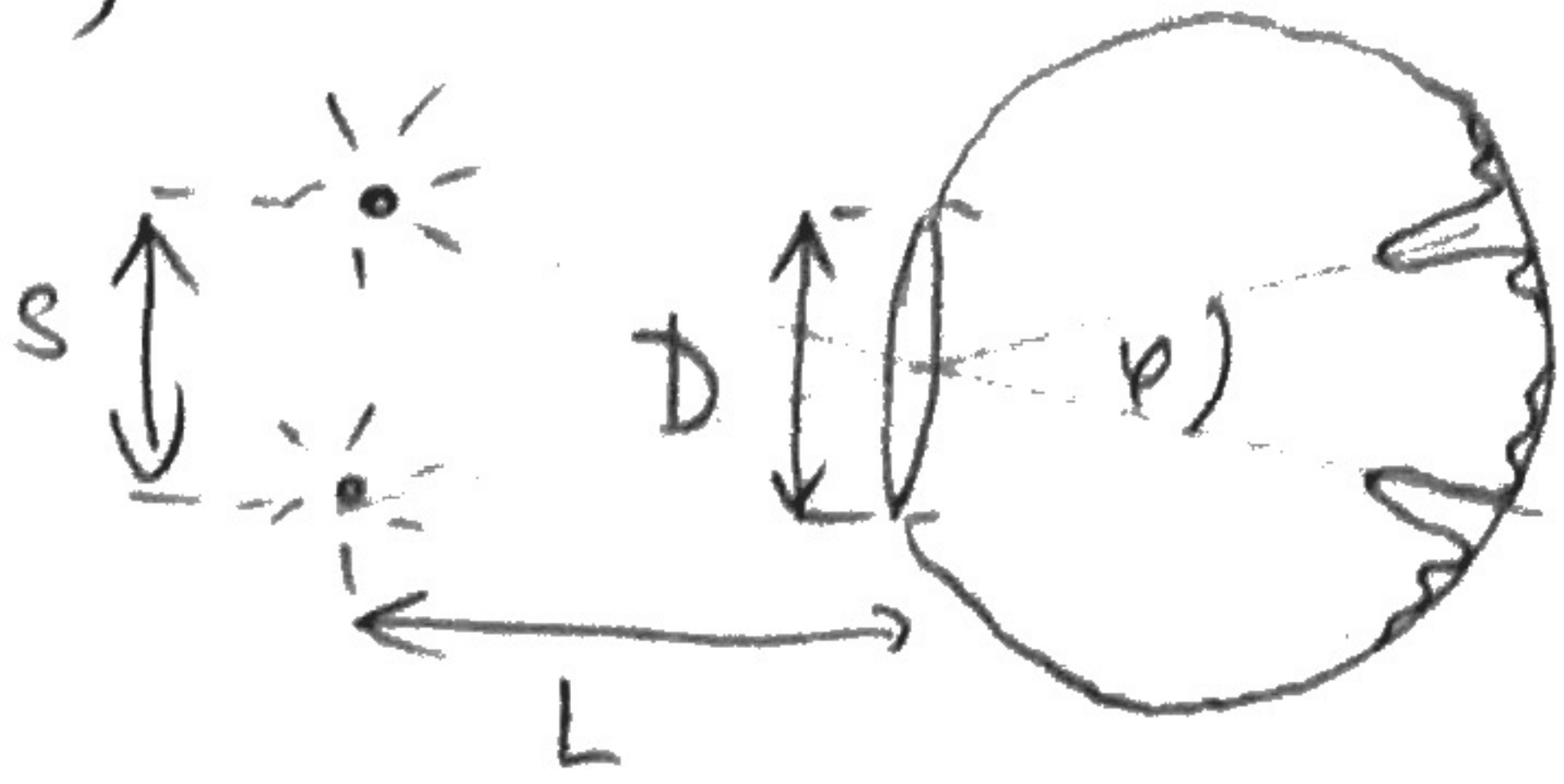
$$\Delta \varphi = \frac{d \sin \alpha}{\lambda} \cdot 2\pi$$

$$\sin \alpha = \frac{1}{3} \frac{\lambda}{d}$$

(A)

$$\Delta x = l \tan \alpha \approx \frac{1}{3} \frac{\lambda l}{d} = \underline{13,3 \text{ mm}}$$

8.)



Rayleigh-kriterium: $\varphi \geq 1,22 \frac{\lambda}{D}$

$$\varphi = \frac{s}{L} \rightarrow L = \frac{s \cdot D}{1,22 \lambda} = 1967 \text{ m}$$

(B)

9.)

(C)