

Тренажер формул по физике

Электромагнетизм



Уравнение зависимости силы тока от времени при электрических колебаниях



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Сила Ампера



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



ЭДС самоиндукции



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Сила Лоренца



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



ЭДС индукции в проводнике, движущемся в магнитном поле



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta \Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Магнитный поток



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta \Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Закон сохранения энергии в колебательном контуре



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Энергия магнитного поля катушки с током



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Уравнение колебаний заряда в колебательном контуре



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Циклическая частота в колебательном контуре



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



ИНДУКТИВНОСТЬ катушки



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta \Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Формула Томпсона



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Связь амплитуды силы тока и амплитуды заряда в колебательном контуре



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvl \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta\Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



Закон электромагнитной индукции



$$F_A = BIl \sin \alpha$$

$$F_L = Bvq \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$L = \frac{\Phi}{I}$$

$$W_M = \frac{LI^2}{2}$$

$$\varepsilon_i = Bvls \sin \alpha$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$\varepsilon_i = -\frac{\Delta \Phi}{\Delta t}$$

$$\varepsilon_{is} = -L \frac{\Delta I}{\Delta t}$$

$$\frac{q^2}{2C} + \frac{Li^2}{2} = \frac{q_m^2}{2} = \frac{LI_m^2}{2}$$

$$q = q_m \cos \alpha$$

$$i = I_m \cos\left(\omega t + \frac{\pi}{2}\right)$$

$$I_m = q_m \omega$$

$$T = 2\pi\sqrt{LC}$$



