# Тренажер формул по физике

## Электромагнетизм

# Уравнение зависимости силы тока от времени при электрических колебаниях

$F_A = BIlsin\alpha$

$F_L = Bvqsin\alpha$

$\Phi = BScos\alpha$

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

$W_м = \frac{LI^2}{2}$

$\varepsilon_i = Bvlsin\alpha$

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

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

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

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

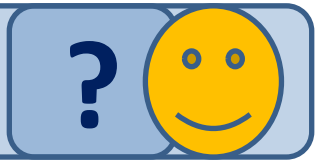
$q = q_m cos\alpha$

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

$I_m = q_m\omega$

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

# Сила Ампера



$F_A = BIlsin\alpha$

$F_L = Bvqsin\alpha$

$\Phi = BScos\alpha$

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

$W_м = \frac{LI^2}{2}$

$\varepsilon_i = Bvlsin\alpha$

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

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

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

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

$q = q_m cos\alpha$

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

$I_m = q_m\omega$

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

# ЭДС самоиндукции

$$F_A = BIlsin\alpha$$

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

$$F_L = Bvqsin\alpha$$

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

$$\Phi = BScos\alpha$$

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

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

$$q = q_m cos\alpha$$

$$W_м = \frac{LI^2}{2}$$

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

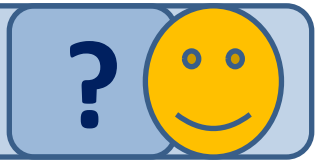
$$\varepsilon_i = Bvlsin\alpha$$

$$I_m = q_m\omega$$

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

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

# Сила Лоренца



$F_A = BIlsin\alpha$

$F_L = Bvqsin\alpha$

$\Phi = BScos\alpha$

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

$W_м = \frac{LI^2}{2}$

$\varepsilon_i = Bvlsin\alpha$

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

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

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

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

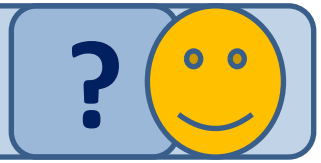
$q = q_m cos\alpha$

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

$I_m = q_m\omega$

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

# ЭДС индукции в проводнике, движущемся в магнитном поле



$F_A = BIlsin\alpha$

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

$F_L = Bvqsin\alpha$

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

$\Phi = BScos\alpha$

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

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

$q = q_m cos\alpha$

$W_м = \frac{LI^2}{2}$

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

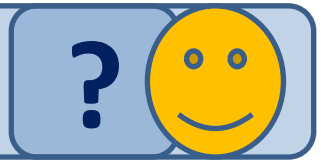
$\varepsilon_i = Bvlsin\alpha$

$I_m = q_m\omega$

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

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

# Магнитный поток



$$F_A = BIlsin\alpha$$

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

$$F_L = Bvqsin\alpha$$

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

$$\Phi = BScos\alpha$$

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

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

$$q = q_m cos\alpha$$

$$W_м = \frac{LI^2}{2}$$

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

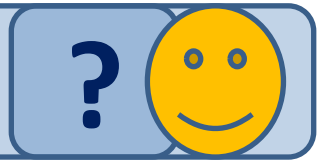
$$\varepsilon_i = Bvlsin\alpha$$

$$I_m = q_m\omega$$

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

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

# Закон сохранения энергии в колебательном контуре



$F_A = BIlsin\alpha$

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

$F_L = Bvqsin\alpha$

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

$\Phi = BScos\alpha$

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

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

$q = q_m cos\alpha$

$W_м = \frac{LI^2}{2}$

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

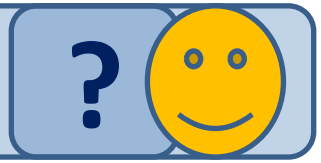
$\varepsilon_i = Bvlsin\alpha$

$I_m = q_m\omega$

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

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

# Энергия магнитного поля катушки с током



$$F_A = BIl\sin\alpha$$

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

$$F_L = Bvq\sin\alpha$$

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

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

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

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

$$q = q_m\cos\alpha$$

$$W_м = \frac{LI^2}{2}$$

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

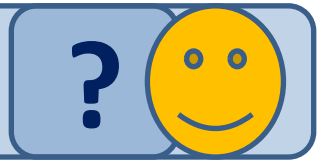
$$\varepsilon_i = Bvl\sin\alpha$$

$$I_m = q_m\omega$$

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

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

# Уравнение колебаний заряда в колебательном контуре



$F_A = BIlsin\alpha$

$F_L = Bvqsin\alpha$

$\Phi = BScos\alpha$

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

$W_м = \frac{LI^2}{2}$

$\varepsilon_i = Bvlsin\alpha$

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

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

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

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

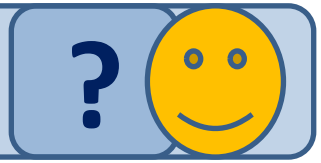
$q = q_m cos\alpha$

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

$I_m = q_m\omega$

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

# Циклическая частота в колебательном контуре



$F_A = BIlsin\alpha$

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

$F_L = Bvqsin\alpha$

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

$\Phi = BScos\alpha$

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

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

$q = q_m cos\alpha$

$W_м = \frac{LI^2}{2}$

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

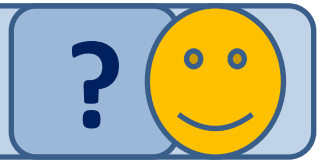
$\varepsilon_i = Bvlsin\alpha$

$I_m = q_m\omega$

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

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

# Индуктивность катушки



$$F_A = BIlsin\alpha$$

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

$$F_L = Bvqsin\alpha$$

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

$$\Phi = BScos\alpha$$

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

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

$$q = q_m cos\alpha$$

$$W_м = \frac{LI^2}{2}$$

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

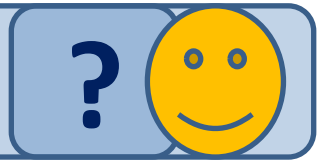
$$\varepsilon_i = Bvlsin\alpha$$

$$I_m = q_m\omega$$

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

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

# Формула Томпсона



$F_A = BIlsin\alpha$

$F_L = Bvqsin\alpha$

$\Phi = BScos\alpha$

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

$W_м = \frac{LI^2}{2}$

$\varepsilon_i = Bvlsin\alpha$

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

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

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

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

$q = q_m cos\alpha$

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

$I_m = q_m\omega$

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

# Связь амплитуды силы тока и амплитуды заряда в колебательном контуре

$$F_A = BIlsin\alpha$$

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

$$F_L = Bvqsin\alpha$$

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

$$\Phi = BScos\alpha$$

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

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

$$q = q_m cos\alpha$$

$$W_м = \frac{LI^2}{2}$$

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

$$\varepsilon_i = Bvlsin\alpha$$

$$I_m = q_m\omega$$

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

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

# Закон электромагнитной индукции

$F_A = BIlsin\alpha$

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

$F_L = Bvqsin\alpha$

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

$\Phi = BScos\alpha$

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

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

$q = q_m cos\alpha$

$W_м = \frac{LI^2}{2}$

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

$\varepsilon_i = Bvlsin\alpha$

$I_m = q_m\omega$

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

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