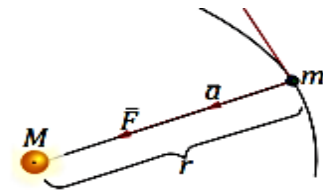


Massasi 1 t bo'lgan avtomobil radiusi 100 m bo'lgan aylana bo'y-
lab o'zgarmas 20 m/s tezlik bilan harakatlanmoqda. Avtomobilga
ta'sir qilayotgan markazga intilma kuchni toping.

Berilgan:	Formula:	Hisoblash:
$m = 1 \text{ t} = 1 \cdot 10^3 \text{ kg}$ $R = 100 \text{ m}$ $v = 20 \text{ m/s}$	$F_{mi} = \frac{mv^2}{R}$	$F_{mi} = \frac{1 \cdot 10^3 \text{ kg} \cdot \left(20 \frac{\text{m}}{\text{s}}\right)^2}{100 \text{ m}} = 4 \cdot 10^3 \text{ N} = 4 \text{ kN}$
$F_{mi} = ?$		Javob: $F_{mi} = 4 \text{ kN}$.

2. Yer o'rtacha 30 km/s tezlik bilan orbita bo'ylab harakat qiladi.
Yer orbitasining radiusi $1,5 \cdot 10^8 \text{ km} = 1,5 \cdot 10^{11} \text{ m}$ ekanligidan foydalanib Quyosh-
ning massasini toping (1.14-rasm).



1.14-rasm

Berilgan:	Formula:	Hisoblash:
$v = 30 \text{ km/s} = 3 \cdot 10^4 \text{ m/s}$ $R = 1,5 \cdot 10^8 \text{ km} = 1,5 \cdot 10^{11} \text{ m}$ $G = 6,67 \cdot 10^{-11} \text{ N} \cdot \text{m}^2 / \text{kg}^2$	$F = G \frac{Mm}{R^2}; F = ma$	$M = \frac{1,5 \cdot 10^{11} \text{ m} \cdot (3 \cdot 10^4 \text{ m/s})^2}{6,67 \cdot 10^{-11} \frac{\text{N} \cdot \text{m}^2}{\text{kg}^2}} \approx 2 \cdot 10^{30} \text{ kg}$
$M = ?$	$a = \frac{v^2}{R}; M = \frac{Rv^2}{G}$	Javob: $M \approx 2 \cdot 10^{30} \text{ kg}$.

3. Ko'lda suv betidagi to'lqin 6 m/s tezlik bilan tarqaladi. Agar
to'lqin uzunligi 3 m bo'lsa, uning tebranish davrini va chastotasini
toping.

Berilgan:	Formula:	Hisoblash:
$v = 6 \text{ m/s}$ $\lambda = 3 \text{ m}$ $T = ? \nu = ?$	$\lambda = vT$	$T = \frac{3 \text{ m}}{6 \frac{\text{m}}{\text{s}}} = 0,5 \text{ s} \quad \nu = \frac{6 \frac{\text{m}}{\text{s}}}{3 \text{ m}} = 2 \text{ Hz}$
	$\lambda = \frac{v}{\nu} \quad T = \frac{\lambda}{v}$	Javob: $T = 0,5 \text{ s}, \quad \nu = 2 \text{ Hz}$.
	$\nu = \frac{v}{\lambda}$	

O'ramlar soni 2000 ta, o'qining radiusi 15 cm bo'lgan toroiddan
o'tayotgan tokning kuchi 3 A bo'lsa, toroid o'qida yotgan nuqtalarda-
gi magnit induksiyasining son qiymatini toping.

Berilgan:	Formula:	Hisoblash:
$N = 2000$ $R = 0,15 \text{ m}$ $I = 3 \text{ A}$ $\mu_0 = 4\pi \cdot 10^{-7} \text{ T} \cdot \text{m/A}$	$B = \frac{\mu_0 NI}{2\pi R}$	$B = \frac{2000 \cdot 3 \text{ A} \cdot 4\pi \cdot 10^{-7} \text{ T} \cdot \text{m/A}}{2\pi \cdot 0,15 \text{ m}} = 8 \cdot 10^{-3} \text{ T}$
$B = ?$		Javob: $B = 8 \cdot 10^{-3} \text{ T}$.

3. Induksiyasi 10^{-3} T bo'lgan bir jinsli magnit maydonda 1,5 cm radiusli aylana bo'ylab magnit kuch chiziqlariga tik yo'nalishda harakatlanayotgan elektronning tezligini toping. Elektronning massasi $9,1 \cdot 10^{-31}$ kg va zaryadining moduli $1,6 \cdot 10^{-19}$ C ga teng.

Berilgan:	Formula:	Hisoblash:
$B = 1 \cdot 10^{-3}$ T $m = 9,1 \cdot 10^{-31}$ kg $R = 1,5 \cdot 10^{-2}$ m $\alpha = 90^\circ$ $e = 1,6 \cdot 10^{-19}$ C $v = ?$	$F_L = e v B \sin \alpha$ $F_{mq} = \frac{m v^2}{R}$ $F_L = F_{mq}$ $v = \frac{e B R \sin \alpha}{m}$	$v = \frac{1,6 \cdot 10^{-19} \text{ C} \cdot 10^{-3} \text{ T} \cdot 1,5 \cdot 10^{-2} \text{ m} \cdot 1}{9,1 \cdot 10^{-31} \text{ kg}} = 2,64 \cdot 10^6 \frac{\text{m}}{\text{s}}$ $= 2,64 \cdot 10^6 \frac{\text{m}}{\text{s}}$ <p>Javob: $v = 2,64 \cdot 10^6$ m/s.</p>

1. Induktivligi 0,6 H ga teng bo'lgan g'altakdan 5 A tok o'tayotgan bo'lsa, g'altakda hosil bo'lgan magnit maydonning energiyasi topilsin.

Berilgan:	Formula:	Hisoblash:
$L = 0,6$ H $I = 5$ A $W_{mag} = ?$	$W_{mag} = \frac{L I^2}{2}$	$W_{mag} = \frac{0,6 \text{ H} \cdot (5 \text{ A})^2}{2} = 7,5 \text{ J}$ <p>Javob: $W_{mag} = 7,5$ J.</p>

2. Magnit maydonning energiyasi 4 mJ bo'lishi uchun induktivligi 0,2 H bo'lgan g'altak chulg'amidagi tok kuchi qanday bo'lishi lozim?

Berilgan:	Formula:	Hisoblash:
$W = 4 \text{ mJ} = 4 \cdot 10^{-3}$ J $L = 0,2$ H $I = ?$	$W_{mag} = \frac{L I^2}{2}$ $I = \sqrt{\frac{2 \cdot W_{mag}}{L}}$	$I = \sqrt{\frac{2 \cdot 4 \cdot 10^{-3} \text{ J}}{0,2 \text{ H}}} = 0,2 \text{ A}$ <p>Javob: $I = 0,2$ A.</p>

Induksiyasi 20 mT bo'lgan bir jinsli magnit maydoni kuch chiziqlari bo'yi 4 sm, eni 3 sm bo'lgan to'g'ri to'rtburchakli ramkaga 60° burchak ostida tushmoqda. Ramkadan o'tayotgan magnit oqimi nimaga teng?

Berilgan:	Formulasi:	Yechilishi:
$B = 20 \text{ mT} = 0,02$ T $a = 4 \text{ sm} = 0,04$ m $b = 3 \text{ sm} = 0,03$ m $\alpha = 60^\circ$ Topish kerak: $\Phi = ?$	$\Phi = B \cdot S \cos \alpha$ $S = a \cdot b$ $[\Phi] = \text{T} \cdot \text{m}^2 = \text{Wb}$	$\Phi = 0,02 \cdot 0,04 \cdot 0,03 \cdot \cos 60^\circ =$ $= 12 \cdot 10^{-6} \text{ Wb.}$ <p>Javobi: $\Phi = 12 \cdot 10^{-6}$ Wb.</p>

1. Amplituda qiymati 30 V bo'lgan o'zgaruvchan tok zanjiriga rezistor ulanganda undan 2 A tok o'tdi. Rezistorda ajralgan o'rtacha quvvatni toping.

Berilgan:	Formulasi:	Yechilishi:
$U_m = 30 \text{ V}$ $I_m = 2 \text{ A}$	$P = \frac{I_m U_m}{2}$	$P = \frac{2 \text{ A} \cdot 30 \text{ V}}{2} = 30 \text{ W.}$
Topish kerak: $P = ?$		<i>Javobi: 30 W.</i>

1. Elektromagnit to'lqinlar qandaydir bir jinsli muhitda $2 \cdot 10^8$ m/s tezlik bilan tarqalmoqda. Agar elektromagnit to'lqinlarning chastotasi 1 MHz bo'lsa, uning to'lqin uzunligi nimaga teng?

Berilgan:	Formulasi:	Yechilishi:
$v = 2 \cdot 10^8 \text{ m/s}$ $\nu = 1 \text{ MHz} = 10^6 \text{ Hz}$	$\lambda = \frac{v}{\nu}$	$\lambda = \frac{2 \cdot 10^8}{10^6} \frac{\text{m/s}}{\text{Hz}} = 200 \text{ m.}$
Topish kerak: $\lambda = ?$		<i>Javobi: 200 m.</i>