

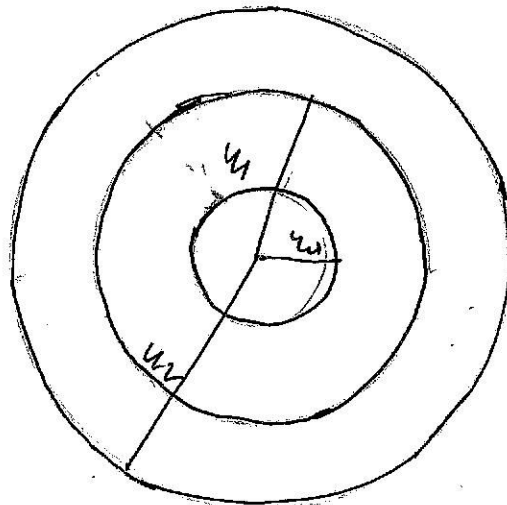
Авг 1

Бен-06

9 ку

2) Дано:

$\gamma_2 = 0,3R$
 $\gamma_1 \in [0,3; 0,7]R$
 $\rho_2 = 600 \text{ кг/м}^3$
 $\gamma_2 \in [0,7; 1]R$
 $\rho_1 = 300 \text{ кг/м}^3$
 $\rho_{cp} = 1530 \text{ кг/м}^3$
 $\rho_2 = ?$



$$\rho_{cp} = \frac{m_{об}}{V_{об}} = \frac{m_2 + m_1 + m_2}{V_2 + V_1 + V_2}$$

$$\rho_{cp} (V_2 + V_1 + V_2) = m_2 + m_1 + m_2$$

$$\rho_{cp} \left(\frac{4}{3}\pi \gamma_2^3 + \frac{4}{3}\pi \gamma_1^3 + \frac{4}{3}\pi \gamma_2^3 \right) = \frac{4}{3}\pi \gamma_2^3 \rho_2 + \frac{4}{3}\pi \gamma_1^3 \rho_1 + \frac{4}{3}\pi \gamma_2^3 \rho_2$$

$$\rho_{cp} \frac{4}{3}\pi \left((0,3R)^3 + ((0,7R)^3 - (0,3R)^3) + R^3 - (0,7R)^3 \right) = \frac{4}{3}\pi \left((0,3R)^3 \rho_2 + (0,7R)^3 \rho_1 - (0,3R)^3 \rho_2 + (R^3 - (0,7R)^3) \rho_2 \right)$$

$$\rho_{cp} R^3 (0,027 + 0,316 + 0,657) = R^3 (0,027 \rho_2 + 0,316 \rho_1 + 0,657 \rho_2)$$

$$\rho_2 = \frac{\rho_{cp}(0,027 + 0,316 + 0,657) - 0,316 \rho_1 - 0,657 \rho_2}{0,027} = \frac{1530 \text{ кг/м}^3 \cdot 1 - 0,316 \cdot 600 \text{ кг/м}^3 - 600 \text{ кг/м}^3 \cdot 0,657}{0,027} = \frac{1041 \text{ кг/м}^3}{0,027} = 38555,5 \text{ кг/м}^3$$

Ответ: $38555,5 \text{ кг/м}^3$

1) Дано:

Решение.

$$F_T = F_{T0}$$

$$l_{QQ'} = 60 \cdot 10^3 \text{ км}$$

$$T = T_0$$

$$\rho = \rho_0$$

$$a = ?$$

$$R = ?$$

Сила тяжести на высоте больше

$$\text{Сила тяжести на высоте на } a_y = \frac{4\pi^2 R_0}{T^2} = \frac{49 \cdot 6400}{(24 \cdot 3600)^2}, \text{ то, очевидно,}$$

Эффекты пренебрежимо малы

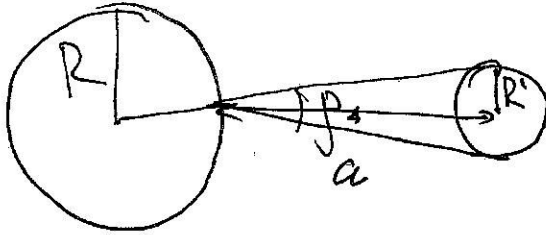
Ans 2

Ben-06

$$R = \frac{C \cdot \lambda}{2\pi} = \frac{300 \cdot 10^3 \text{ km}}{d=3} = 10^4 \text{ km}$$

g_{\oplus}

$$R_{\oplus} = \frac{1700 \text{ km}}{384400} = 1700 \text{ km}$$



$$g = \frac{GM}{R^2} \quad g_{\oplus} = \frac{GM_{\oplus}}{R_{\oplus}^2}$$

$$\frac{GM}{R^2} = \frac{GM_{\oplus}}{R_{\oplus}^2}$$

$$M = \frac{R^2 \cdot M_{\oplus}}{R_{\oplus}^2} = \frac{(10^4 \text{ km})^2 \cdot 6 \cdot 10^{26} \text{ kg}}{(6400 \text{ km})^2}$$

$$= \frac{10^8 \cdot 6 \cdot 10^{26} \text{ km}^2}{6,4 \cdot 10^6 \text{ km}^2} = 2 \cdot 10^{26} \text{ kg}$$

$$\frac{T^2}{a^3} = \frac{4\pi}{GM}$$

$$a^3 = \frac{GM T^2}{4\pi} = \frac{6,67 \cdot 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2} \cdot (27,32 \cdot 24 \cdot 3600 \text{ s})^2}{4\pi}$$

$$= \frac{10^{15} \cdot 27,32^2 \cdot 24^2 \cdot 3600^2}{4} = 3 \cdot 10^{27} \text{ m} = 3 \cdot 10^{24} \text{ km}$$

$$a = \sqrt[3]{3 \cdot 10^{24} \text{ km}} \approx 10^8 \text{ km}$$

$$R' = \frac{R_{\oplus} \cdot a}{R_{\oplus}} = \frac{1700 \text{ km}}{384400} \cdot 10^8 \text{ km} = \frac{17 \cdot 10^3 \text{ km}}{3844 \cdot 2}$$

$$= 2 \cdot 10^6 \text{ km}$$

Orbits: $2 \cdot 10^6 \text{ km}$; $3 \cdot 10^{24} \text{ km}$

Мес 3

Бел-06

9 мс

4) Дано:

$$R(t) \propto E^{1/5} \cdot t^{2/5}$$

$$D = 300 \text{ нк}$$

$$P_1 = 32 P_2$$

$$D = ?$$

Решение:

$$R_1 + R_2 = D$$

$$L_1 = 32 L_2$$

$$E = \frac{L}{4\pi R^2}$$

$$R_1(t) \propto \left(\frac{L}{4\pi R_1^2} \right)^{1/5} \cdot t^{2/5}$$

$$R_2(t) \propto \left(\frac{32L}{4\pi R_2^2} \right)^{1/5} \cdot t^{2/5}$$

$$\frac{R_1(t)}{R_2(t)} = \left(\frac{R_2^2}{32R_1^2} \right)^{1/5}$$

$$\frac{R_1}{R_2} = \left(\frac{R_2}{32R_1} \right)^{2/5}$$

$$\frac{D - R_2}{R_2} = \left(\frac{R_2}{32D - 32R_2} \right)^{2/5}$$

$$\frac{D}{R_2} - 1 = \left(\frac{R_2}{32D - 32R_2} \right)^{2/5}$$

Решаем уравнение методом

возврата, получим, что

$$R_2 = 200 \text{ нк} \Rightarrow R_1 = 100 \text{ нк}$$

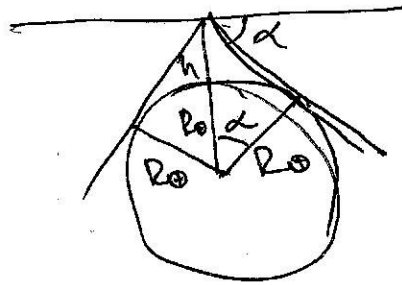
Ответ: 200 нк

Lucy

Blu-06
Jkm

5) Dans: $h = 442 \text{ m}$
 $\varphi = 25^\circ \text{ c.m.}$
 $\Delta t = ?$

Penene:



$$d = \arccos\left(\frac{R_0}{R_0+h}\right) \approx 40', \text{ r.k. memo}$$

$$R_0 = R_0 + h \quad \omega_0 = \omega_0 = 15^\circ/\text{h} = 15 \text{ } \frac{1}{\text{min}}$$

$$t_u = \frac{180^\circ}{\omega_0}$$

$$t_b = \frac{180^\circ + 2d}{\omega_0}$$

$$\Delta t = t_b - t_u = \frac{180^\circ + 2d}{\omega_0} - \frac{180^\circ}{\omega_0} = \frac{180^\circ + 40'}{15 \text{ } \frac{1}{\text{min}}} - \frac{180^\circ}{15 \text{ } \frac{1}{\text{min}}}$$

$$= \frac{10800'}{15 \text{ } \frac{1}{\text{min}}} - \frac{10800'}{15 \text{ } \frac{1}{\text{min}}} = \frac{d}{3} \approx 3 \text{ min}$$

Obes: 3 min

3) Dans: $n = 160 \cdot 10^6$
 $t = 2,5 \text{ min}$
 $h' = ?$

Penene

Equa za wj pomjeru $160 \cdot 10^6$, go

za 2,5 min - x

$$365 \cdot 24 \cdot 60 = 160 \cdot 10^6$$

$$2,5 - x$$

$$x = \frac{2,5 \cdot 160 \cdot 10^6}{365 \cdot 24 \cdot 60} = \frac{10^6}{146 \cdot 3}$$

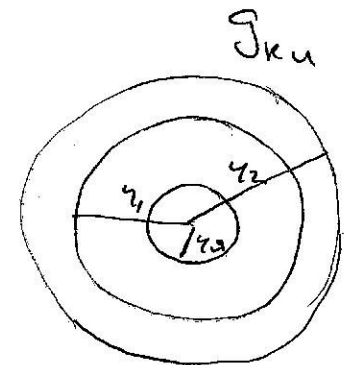
$$= 2300$$

Obes: 2300 renoken

Упробуе

Маг 1 Бул-06

- 1) $r \in [0, 3R]$
- $\rho_1 = 300 \text{ кг/м}^3$
- $r \in [0, 3; 0,7] R$
- $\rho_2 = 600 \text{ кг/м}^3$
- $r \in [0, 7; 1] R$
- $\rho_{cp} = 1530 \text{ кг/м}^3$



$\rho_{cp} = ?$

$$V_1 = \frac{4}{3} \pi ((0,7R)^3 - (0,3R)^3) = \frac{4}{3} \pi 0,27 R^3$$

$$V_2 = \frac{4}{3} \pi (R^3 - (0,7R)^3) = \frac{4}{3} \pi R^3 (1 - 0,343) = \frac{4}{3} \pi 0,657 R^3$$

$$\rho_{cp} = \frac{m_{tot}}{V_{tot}} = \frac{m_1 + m_2}{V_1 + V_2}$$

$$V_1 = \frac{4}{3} \pi r_1^3 = \frac{4}{3} \pi (0,3R)^3$$

$$V_2 = \frac{4}{3} \pi (R^3 - (0,7R)^3) = \frac{4}{3} \pi (0,657 R^3)$$

$\begin{array}{r} 49 \\ \times 7 \\ \hline 343 \end{array}$
 $\begin{array}{r} 343 \\ - 27 \\ \hline 313 \end{array}$

$\begin{array}{r} 0,027 \\ + 0,313 \\ + 0,657 \\ \hline 0,997 \end{array}$

$\begin{array}{r} 0,557 \\ \times 1,530 \\ \hline 2991 \\ 557 \\ \hline 852541 \end{array}$

$\begin{array}{r} 0,313 \\ \times 300 \\ \hline 93900 \end{array}$
 $\begin{array}{r} 0,657 \\ \times 600 \\ \hline 394200 \end{array}$

$$m = m_1 + m_2 = \rho_1 V_1 + \rho_2 V_2$$

$$(V_1 + V_2) \rho_{cp} = \rho_1 V_1 + \rho_2 V_2$$

$$\rho_{cp} = \frac{\rho_1 V_1 + \rho_2 V_2}{V_1 + V_2} = \frac{300 \cdot \frac{4}{3} \pi (0,27 R^3) + 600 \cdot \frac{4}{3} \pi (0,657 R^3)}{\frac{4}{3} \pi (0,27 R^3 + 0,657 R^3)}$$

$$\rho_{cp} = \frac{300 \cdot 0,27 + 600 \cdot 0,657}{0,27 + 0,657} = \frac{1041}{0,927} = 1133,65$$

$$\frac{1530}{1,525} - 93,9 - 394,2 = 1041$$

$$\frac{1041}{0,927} = 1133,65$$

$\begin{array}{r} 1041000 \\ - 81000 \\ \hline 231000 \\ 216000 \\ \hline 155000 \\ 135000 \\ \hline 240000 \\ 216000 \\ \hline 24000 \\ 22000 \\ \hline 2000 \end{array}$

$\begin{array}{r} 1037310 \\ - 81000 \\ \hline 227310 \\ - 216000 \\ \hline 113000 \\ 108000 \\ \hline 5000 \\ 54000 \\ \hline 59000 \end{array}$

Черновик

Лист 2 Бел-00

9 кил

$$\begin{array}{r}
 27 \\
 \times 27 \\
 \hline
 189 \\
 54 \\
 \hline
 729
 \end{array}$$

$$\begin{array}{r}
 3600 \\
 \times 3600 \\
 \hline
 2160000 \\
 108 \\
 \hline
 21960000
 \end{array}$$

$$\begin{array}{r}
 390 \\
 \hline
 \times
 \end{array}
 \quad -1 = \quad
 \begin{array}{r}
 25 \\
 \times \\
 \hline
 32.300 - 32 \times
 \end{array}$$

100 - remainder

$$\begin{array}{r}
 200 \\
 \hline
 \hline
 2
 \end{array}$$

$$\begin{array}{r}
 24 \\
 \times 24 \\
 \hline
 96 \\
 8 \\
 \hline
 176
 \end{array}$$

$$\begin{array}{r}
 728 \\
 \times 176 \\
 \hline
 4374 \\
 12800 \\
 \hline
 128304
 \end{array}$$