:

10.1   ,

12-   ,   (h   m   )

                                        φ   ,

            12-   .

                                                                                                                    :

$\omega=360$ $/12$ $=30$ $/$ $=0,5$ $/$

                  φ   ,

      $=$ $\{\varphi/\omega\}=$ $\{\varphi(\quad):0,5\quad/\quad\}$,
                          h

$h=$ $\{\quad/60\}$

$m=$ $-60\cdot h$.

                                  12-   ,

                                            .   .

                                      h   ,

                                  12

                        .

            10.2.   (, –1,46),   (, –0,72),

      (, -0,27),   (, –0,04),   (, 0,03).

            10.3.   ,

      m   2,512   (m+1).

                                                                                                      5,024   .

                  ,

                                .

.

»   , . . 5,024 5.

10.4.

-

$$j = \sigma T^4. \quad (1)$$

(j=P/S –   ,

=5,67·10⁻⁸   . ⁻¹. ⁻². ⁻⁴ –   -   )

,

$$= b/ . \quad (2)$$

,   S=4 R²,   (1)   (2)   :

$$R = \sqrt{\dfrac{P}{4f\dagger(b/\})^4}} \approx 700000 \quad .$$

10.5.   ,

.

,

«   » (   ),

,

,   .

$$g = \dfrac{GM}{R^2},$$

G -   , M -   , R -   .

,

.

dR

$$dg = -2\frac{GM}{R^3}\,dR,$$

$$dR = -\frac{R^3}{2GM}\,dg.$$

,

,

. dg

. h (- , h -

), ,

h /c , ,

(c -). $L,$

$L/c,$,

- , . ,

$$dg = \frac{L}{c \cdot m},$$

m - .

$$\frac{R^3}{2GM}$$

. III

$$\frac{P^2}{R^3} = \frac{4\pi^2}{GM},$$

,

$$\frac{R^3}{2GM} = \frac{P^2}{8\pi^2}.$$

:

$$dR = -\frac{P^2}{8\pi^2} \cdot \frac{L}{c \cdot m},$$

:

3 .

10.6. ,

, ,

.

. (,

( ))

R : $F=F_0(10\ \ /R)^2$, F_0 -

10 .

$$m = -2.5\lg F + const = -2.5\lg(F_0(10\quad/R)^2) = \left[-2.5\lg F_0 + const\right] + 5\lg(R/10\quad)$$

M. ,

$m=M+5\lg(R/10\quad)$. ,

,

$$R = 10^{(m-M)/5} \cdot 10\quad = 10^{1+(m-M)/5}\quad = 10^{1+(14-(-21))/5}\quad = 10^8$$

$V=4\ R^3/3$ R.

$N=nV= 4\ nR^3/3$, $n=1/10\quad {}^{-3}=10^{-19}\quad {}^{-3}$

- .

$$f = \frac{N}{T} = \frac{4f\,nR^3}{3T} = \frac{4 \cdot 3.14 \cdot 10^{-19} \cdot (10^8)^3}{3 \cdot 100} \approx 4200 \qquad /\quad ,$$

$=100$ -

.