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3.

2R

$$F_{\text{грав}} = G \frac{m^2}{(2R)^2},$$

$$, F_{\text{грав}} = \frac{mv^2}{R}$$

$$R = \sqrt[3]{\frac{GmT}{16\pi^2}} = 3 \cdot 10^6 .$$

4.

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$$\delta_e = +23^\circ .$$

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$$h = 90^\circ - \varphi + \delta = 48^\circ ,$$

$$- \varphi = 65^\circ .$$

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$$\delta_e = -23^\circ 26' .$$

2°.

5.

$$T = \frac{2\pi R}{V}. \quad (1)$$

$$\frac{GM}{R^2} = \frac{v^2}{R}. \quad (2)$$

$$\rho = \frac{3\pi}{GT^2} = 1,3 \cdot 10^{14} \text{ / }^3.$$

6.

h , $h = 400$ R , D , $R +$

$$(R + h)^2 = D^2 + R^2, \quad D^2 = 2Rh + h^2 = 2Rh \left(1 + \frac{h}{2R} \right).$$

$$h \ll R,$$

$$h \ll R: D = \sqrt{2Rh}. \quad D \ll R,$$

$$s = \pi D^2,$$

$$S = 4\pi R^2.$$

$$\frac{s}{S} = \frac{h}{2R} = 0,03 \text{ (. . 3\%)}.$$