

ЗАОЧНАЯ ФИЗМАТШКОЛА

ИЗБРАННЫЕ ЗАДАНИЯ
РОССИЙСКИХ И
ЗАРУБЕЖНЫХ ЭКЗАМЕНОВ И
ОЛИМПИАД

$$M_S = 1.9885 \times 10^{30} \text{kg}$$

$$G = 6.67430 \times 10^{-11} \frac{\text{Nm}^2}{\text{kg}^2}$$

$$T = 365 \times 24 \times 60 \times 60 \text{s} = 31536000 \text{s}$$

$$\begin{cases} G \frac{\cancel{M_E} M_S}{R^2} = a \cancel{M_E} \\ a = \omega^2 R \\ \omega = \frac{2\pi}{T} \end{cases} \implies G \frac{M_S}{R^2} = \left(\frac{2\pi}{T} \right)^2 R \implies R = \sqrt[3]{GM_S \frac{T^2}{(2\pi)^2}}$$

$$R = 1.4952 \times 10^{11} \text{m}$$

$$R_{\text{expected}} = 1.4959 \times 10^{11} \text{m}$$