

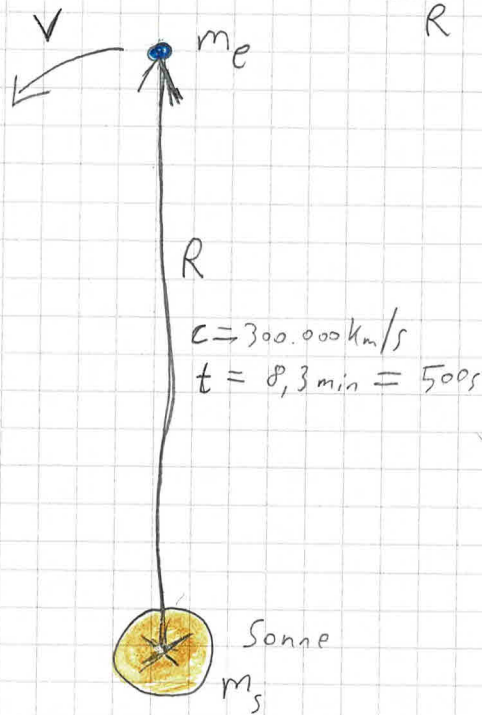
$$G = 6,6743015 \cdot 10^{-11} \text{ m}^3/\text{kg s}^2$$

$$F_F = F_G$$

$$\frac{m_e \cdot v^2}{R} = G \cdot \frac{m_e \cdot m_s}{R^2}$$

$$v^2 = \frac{G \cdot m_s}{R}$$

$$m_s = \frac{v^2 \cdot R}{G}$$



$$c = \frac{R}{t} \rightarrow c \cdot t = \underline{R} = 300.000 \text{ km/s} \cdot 500 \text{ s} = \underline{150 \cdot 10^6 \text{ km}} = 150 \cdot 10^9 \text{ m}$$

(lt. Google $149,6 \cdot 10^6 \text{ km}$)

$$U(\text{Erdumlaufbahn}) = 2 \cdot R \cdot \pi = 9,4 \cdot 10^8 \text{ km}$$

$$T(\text{Erdumlaufzeit}) = 1 \text{ JAHR} = 365 \text{ TAGE} = 8.760 \text{ h}$$

$$\underline{v} = \frac{U}{T} = \frac{9,4 \cdot 10^8 \text{ km}}{8.760 \text{ h}} = \underline{107.600 \text{ km/h}} = 3,0 \cdot 10^4 \text{ m/s}$$

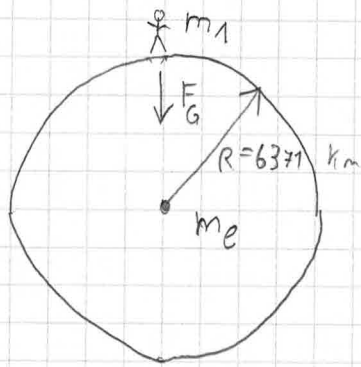
(lt. Google 107.000 km/h)

$$\underline{m_s} = \frac{(3,0 \cdot 10^4 \text{ m/s})^2 \cdot 150 \cdot 10^9 \text{ m}}{6,67430 \cdot 10^{-11} \text{ m}^3/\text{kg s}^2} = \underline{2,0 \cdot 10^{30} \text{ kg}}$$

(lt. Google $1,989 \cdot 10^{30} \text{ kg}$)

BERECHNUNG DER ERDMASSE (ANNAHME IDEALE KUGEL!)

$$g = 9,81 \text{ m/s}^2 \text{ (Erdbeschleunigung)}$$



$$F_G = m_1 \cdot g = G \cdot \frac{m_1 \cdot m_e}{R^2}$$

$$m_e = \frac{g}{G} \cdot R^2 = \frac{9,81 \text{ m/s}^2 \cdot (6,371 \cdot 10^6 \text{ m})^2}{6,67430 \cdot 10^{-11} \text{ m}^3/\text{kg s}^2} =$$

$$\underline{\underline{m_e = 5,97 \cdot 10^{24} \text{ kg}}}$$