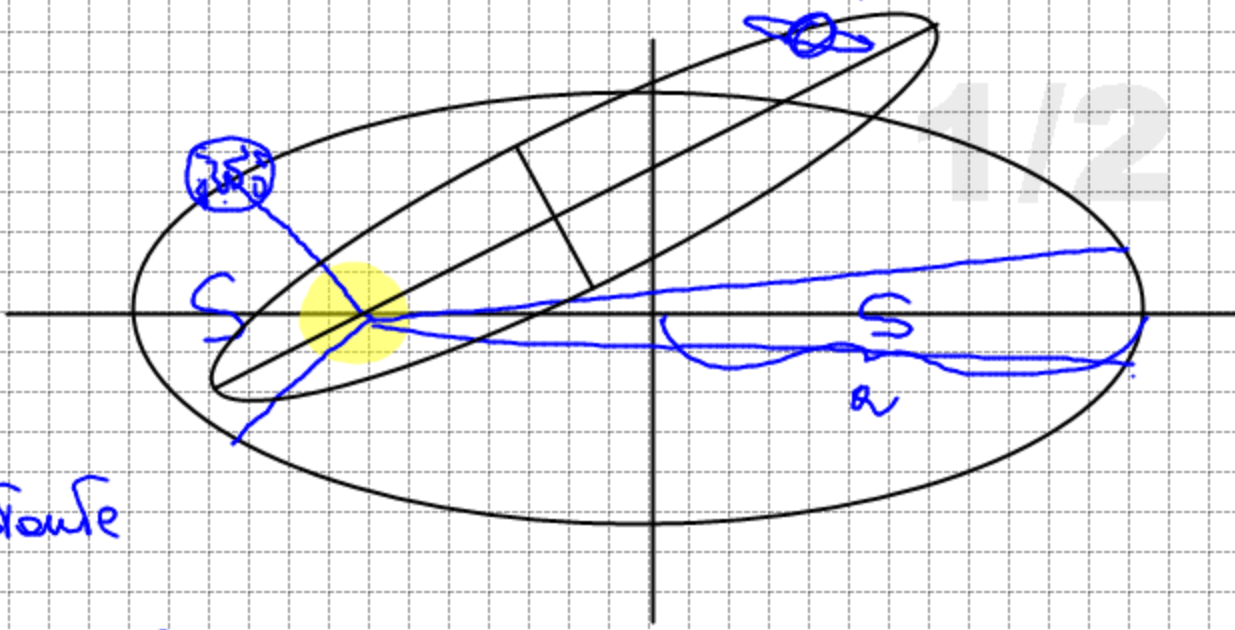


GRAVITAZIONE UNIVERSALE

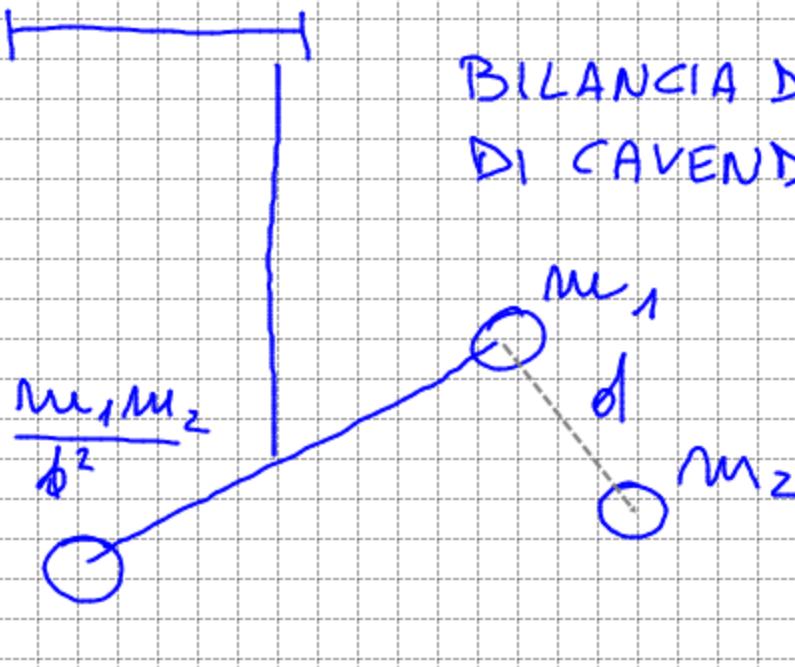


$$\frac{r^3}{T^2} = \text{costante}$$

$$\frac{r_T^3}{T_T^2} = \frac{r_P^3}{T_P^2}$$

$$P = mg$$

$$\left. \begin{aligned} F_G &\propto m_1 m_2 \\ F_G &\propto \frac{1}{d^2} \end{aligned} \right\} \frac{m_1 m_2}{d^2}$$



BILANCIA DI TORSIONE DI CAVENDISHI.

$$F_G = G \frac{m_1 m_2}{d^2} \quad G \approx 6,67 \times 10^{-11} \frac{\text{N m}^2}{\text{kg}^2}$$

$$P = mg \quad F_G = G \frac{m M_T}{d^2}$$

$$P = F_G$$

$$mg = G \frac{m M_T}{d^2}$$

$$G = \frac{g d^2}{M_T}$$

ESEMPIO

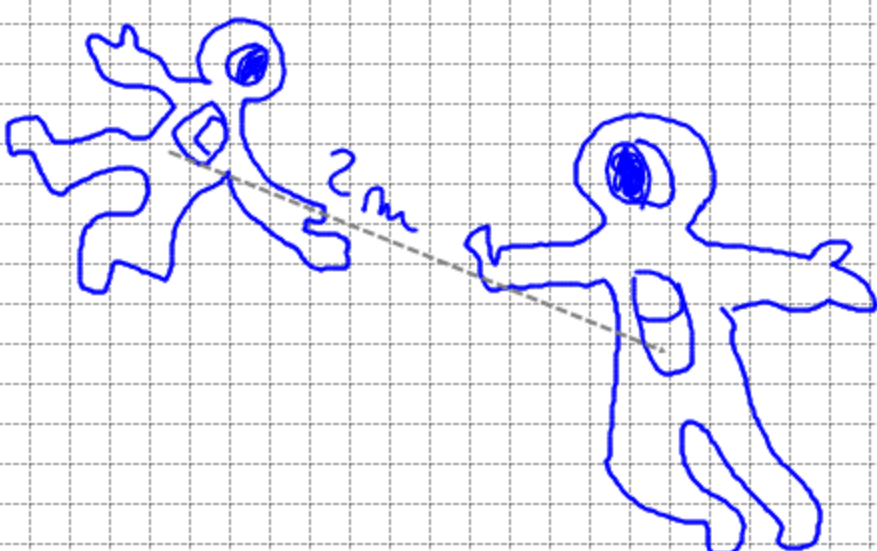
Siamo sulla superficie della Terra vediamo la forza peso da ci attrae:

$$F_G = G \frac{m M_T}{d^2} =$$

$$= 6,67 \times 10^{-11} \frac{\text{N m}^2}{\text{kg}^2} \cdot \frac{60 \text{ kg} \cdot 6 \times 10^{24} \text{ kg}}{40,96 \times 10^{12} \text{ m}^2} =$$

$$= 590 \text{ N} = 0,6 \times 10^3 \text{ N} = 0,6 \text{ kN}$$

ESEMPIO



Vuoto quasi assoluto.
Come si attraggono?
Sono a 2 m di distanza

$$m_1 = m_2 = 100 \text{ kg}$$

Quanto Tempo impiegano le Torcosemi?

$$F_G = G \frac{m_1 m_2}{\left(\frac{d}{2}\right)^2}$$

$$\bar{F}_G = G \frac{m^2}{\left(\frac{d}{2}\right)^2}$$

$$\frac{d}{2} = s$$

$$a = \frac{\bar{F}_G}{m} = \frac{G m^2}{x^2} \frac{1}{m}$$

$$s = \frac{1}{2} a t^2 \rightarrow s = \frac{1}{2} \frac{G m}{s^2} t^2$$

$$t^2 = \frac{2s^3}{Gm}$$

$$t = \sqrt{\frac{2s^3}{Gm}} \approx 3,5 \times 10^4 \text{ s} \approx 10 \text{ h}$$