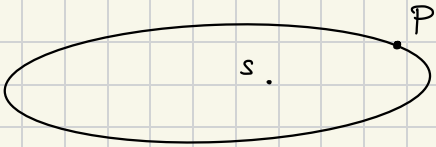
Pag 299 e seguenti:

12:



$a = 5{,}91 \cdot 10^{12}\ m$

$e = 0{,}249$

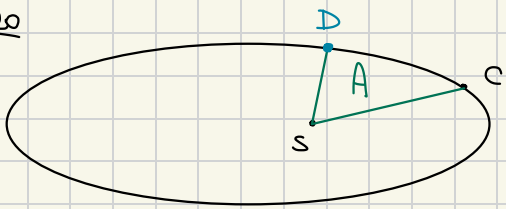
$b = ?$

$e = \frac{c}{a} \rightsquigarrow c = e \cdot a$

$a^2 = b^2 + c^2 \rightsquigarrow b^2 = a^2 - c^2 = a^2 - e^2a^2 \rightsquigarrow b = \sqrt{a^2 - e^2a^2}$

$\rightsquigarrow \boxed{b = a\sqrt{1-e^2}} \approx 5{,}72 \cdot 10^{12}\ m$

20



$A = \frac{1}{15}$ Area ellisse

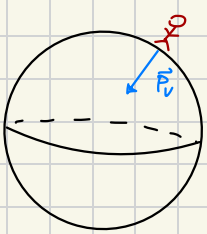
Per fare il tratto CD ci mette 8 mesi

Periodo di riv. della cometa = ?

II Legge di Keplero: Aree uguali in tempi uguali

$\Rightarrow$ Tempo di rivoluzione $8\ mesi \cdot 15 = 120\ mesi = 10\ anni.$

38:



Peso su Venere $\leftarrow P_V = 427\ N$

$m = 82\ kg$

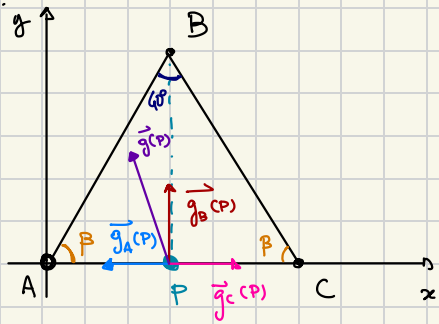
$R_V = 6{,}05 \cdot 10^3\ km = 6{,}05 \cdot 10^6\ m$

- $g_V = ?$
- $M_V = ?$

- $P_V = m\, g_V \rightsquigarrow g_V = \frac{P_V}{m} \approx 8{,}87\ \frac{m}{s^2}$

- $P_V = G\frac{M_V\, m}{R_V^2} \rightsquigarrow M_V = \frac{P_V R_V^2}{G m} \approx 4{,}87 \cdot 10^{24}\ kg$

91:



$\alpha = 40°$

$AB = BC = 342\ km = 342 \cdot 10^3\ m$

$m_A = 8{,}3 \cdot 10^4\ kg$

$m_B = 2{,}1 \cdot 10^5\ kg$

$m_C = 4{,}2 \cdot 10^4\ kg$

Calcola $\vec{g}(P)$, e il modulo

$g_A(P) = G\frac{m_A}{AP^2}$ $\quad \beta = \frac{180 - 40°}{2} = 70°$

$AP = AB\cos\beta$

$BP = AB \cdot \sin\beta$

$PC = AP = AB\cos\beta$

$$\vec{g}_A(P) = (-g_A(P)\ ;\ 0)$$

$g_B(P) = G\frac{m_B}{BP^2}$

$$\vec{g}_B(P) = (0\ ;\ g_B(P))$$

$g_C(P) = G\frac{m_C}{PC^2}$

$$\vec{g}_C(P) = (g_C(P)\ ;\ 0)$$

Faccio la somma tra vettori (componente per componente)

$\vec{g}(P) = \vec{g}_A(P) + \vec{g}_B(P) + \vec{g}_C(P) =$ Ho tutto ↓

$= (-g_A(P) + g_C(P)\ ;\ g_B(P)) = (-1{,}69 \cdot 10^{-16}\ ;\ 1{,}15 \cdot 10^{-16})\ \frac{m}{s^2}$

$$\triangleright\ g(P)^2 = \left(-g_A(P) + g_C(P)\right)^2 + g_B(P)^2$$ (Teorema di Pitagora)

$$g(P) \approx 2{,}04 \cdot 10^{-16}\ \frac{m}{s^2}$$ (Prendendo la radice)