

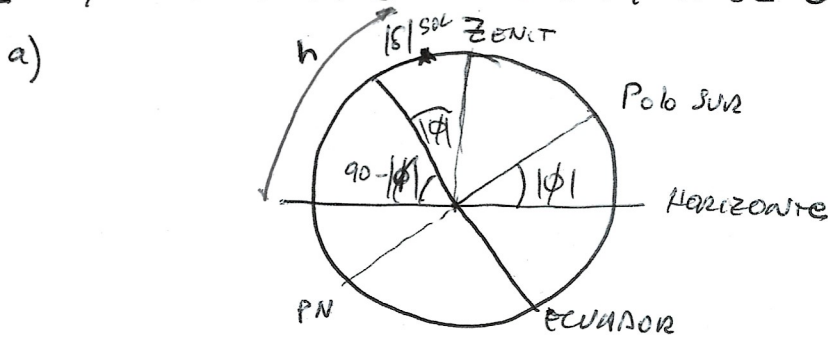
NIVEL 1

D1 $v = 5366 \text{ km/s}$ $H = 71 \text{ km/s/Mpc}$

LEY DE HUBBLE $\rightarrow v = H \cdot D$ $D = \frac{v}{H} = 75,57 \text{ Mpc}$

$1 \text{ pc} = 3,26 \text{ a.l.}$ $\rightarrow 75,57 \times 10^6 \text{ pc} = \boxed{2,46 \times 10^8 \text{ a.l.}}$

D3 $\phi = 40^\circ 24' 49'' \text{ S}$ $\lambda = 64^\circ 10' 52'' \text{ O}$ Fecha 21 DE DIC.



b) DECLINACION DEL SOL $\delta = -23,5^\circ$ (21 DE DIC.)

c) $\boxed{h = 90 - |\phi| + |\delta| = 73,09^\circ}$

D2 $m_A - M_A = -5 + 5 \log(d_A) \Rightarrow M_A = -9,39$
 $m_B - M_B = -5 + 5 \log(d_B) \Rightarrow M_B = 3,73$

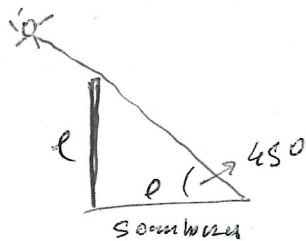
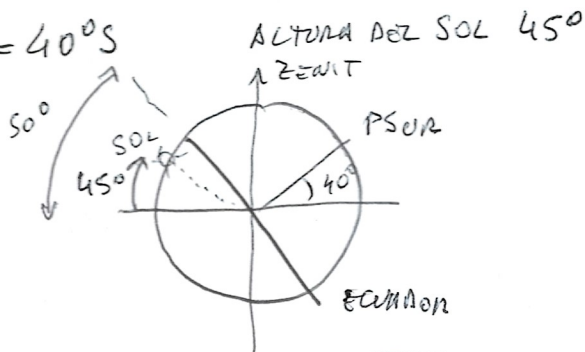
\Rightarrow LA ESTRELLA "A" ES MAS BRILLANTE QUE LA "B".

D4 PARALAJE $p = 0,7687''$ $\bar{v} = 61000 \text{ km/h}$

$d = \frac{1}{p''} = 1,3 \text{ pc}$

$t = \frac{d}{v} = \frac{1,3 \times 3,26 \times 365 \times 24 \times 3600 \times 300000 \text{ km}}{61000 \times \frac{1000}{3600} \frac{\text{km}}{\text{s}}} = 2,36 \times 10^{12} \text{ seg}$
 $= \boxed{75033 \text{ AÑOS}}$

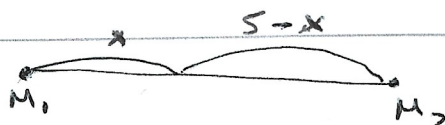
D1 $\phi = 40^\circ S$



\Rightarrow DECLINACIÓN DEL SOL $[+5^\circ]$

LA FECHA SE PUEDE ESTIMAR CON INTERPOLACIÓN Y DADA' PROXIMA A LAS FECHAS MAS PRECISAS QUE SON 2 AL 3 DE ABRIL Y 9 AL 10 DE SEPTIEMBRE.

D2



$$\left. \begin{aligned} M_1 - M_1 &= -5 + 5 \log(x) \\ M_2 - M_2 &= -5 + 5 \log(5-x) \end{aligned} \right\} \Rightarrow -4 + 5 = 5 \log(x) - 5 \log(5-x) = 5 \log\left(\frac{x}{5-x}\right)$$

$$\Rightarrow \frac{x}{5-x} = 10^{0.5} \Rightarrow \boxed{\begin{aligned} x &= 3.065 \text{ pc} = d_1 \\ d_2 &= 5-x = 1.9344 \text{ pc} \end{aligned}}$$

D.3 $e = 0,256$ $a = 1,32 \text{ UA}$

a) Kepler $\frac{4\pi^2}{P^2} a^3 = GM \rightarrow P = 4,78 \times 10^7 \text{ seg} \approx 1,51 \text{ AÑOS}$

b) $d_{\text{AFELIO}} = a(1+e) = 1,65792 \text{ UA} = 2,48 \times 10^{11} \text{ m}$

USANDO LA ECUACIÓN DE VELOCIDAD ELIPTICA (energía):

$$v^2 = 2GM \left(\frac{1}{r} - \frac{1}{2a} \right) \Rightarrow v = 19948 \text{ m/s} = 19,95 \text{ km/s}$$

$r = d_{\text{AFELIO}}$

c) $v_{\text{ESCAPE}} = \sqrt{\frac{2GM}{r}} = 32707 \text{ m/s} \approx 32,7 \text{ km/s}$

VARIACIÓN DE VELOCIDAD $\Delta v = 12959 \text{ m/s} \approx 12,76 \text{ km/s}$

D.4 $R_{\odot} = 696340 \text{ km}$ $T_{\text{eff}} = 5780 \text{ K}$

$D = 2,28 \times 10^8 \text{ km}$

3

a) $I = \frac{4\pi R_{\odot}^2 \sigma T_{\text{eff}}^4}{4\pi D^2} = 590,29 \frac{\text{J}}{\text{s m}^2}$

b) $P_{\text{tot}} = 10 \text{ Watt}$

$A = \pi R^2$

$P_{\text{tot}} = I \cdot A$

$A = \frac{P_{\text{tot}}}{I} = 0,01694 \text{ m}^2$

$R = \sqrt{\frac{A}{\pi}} = 0,073 \text{ m} = 7,3 \text{ cm}$