

Astronomia e Matematica 3

$$\textcircled{1} \quad v = \frac{d}{t} \quad c = \frac{d}{t}$$

Vel. luz
(c)

$$c = 3 \times 10^8 \text{ m/s}$$

$$d = 114 \text{ UA} = 114 \times 1.5 \times 10^{11} \text{ m} \\ = 1.71 \times 10^{13} \text{ m}$$

$$3 \times 10^8 \text{ m/s} = \frac{1.71 \times 10^{13} \text{ m}}{t}$$

$$t = \frac{1.71 \times 10^{13} \text{ m}}{3 \times 10^8 \text{ m/s}} = 57000 \text{ s}$$

$$1 \text{ hora} = 3600 \text{ s} \quad t = \frac{57000}{3600} \approx 15.8 \text{ h}$$

$$\textcircled{2} \quad T = 10 \text{ dias} \Rightarrow L \approx 1000 L_{\odot}$$

(gálico)

$$b = 2.35 \times 10^{-10} \text{ J/s/m}^2$$

$$b = \frac{L}{4\pi d^2}$$

$$d = \sqrt{\frac{L}{4\pi b}}$$

$$d = \sqrt{\frac{1000 \times 3.8 \times 10^{26} \text{ J/s}}{4\pi \times 2.35 \times 10^{-10} \text{ J/s/m}^2}} =$$

$$= \sqrt{\frac{3.8 \times 10^{29} \text{ J/s}}{2.95 \times 10^{-9} \text{ J/s/m}^2}} = \sqrt{1.288 \times 10^{38} \text{ m}^2} =$$

$$\approx 1.13 \times 10^{19} \text{ m}$$

$$\frac{1.13 \times 10^{19} \text{ m}}{9.46 \times 10^{15} \text{ m}} \approx 1195 \text{ anos luz}$$

$$\textcircled{3} \quad d = \sqrt{\frac{5000 \times 10^6 \times 3.8 \times 10^{26} \text{ J/s}}{4\pi \times 6.8 \times 10^{-11} \text{ J/s/m}^2}} =$$

$$= \sqrt{\frac{1.9 \times 10^{36} \text{ J/s}}{8.54 \times 10^{-10} \text{ J/s/m}^2}} = \sqrt{2.22 \times 10^{45} \text{ m}^2} =$$

$$\approx 4.71 \times 10^{22} \text{ m}$$

$$\frac{4.71 \times 10^{22} \text{ m}}{9.46 \times 10^{15} \text{ m}} \approx 4.98 \times 10^6 \text{ anos luz} \approx 5 \text{ milh\u00e3es de anos luz!}$$