

330
ai/

~~pair of stars moving in an eclipsing orbit around the earth at constant velocity~~
pair of stars, one duller than the other and respectively one larger than the other are moving around ~~the~~ the earth with the larger star closer to centre of mass. When ~~there~~ there is an eclipse & the brighter star is in front of the duller star the resulting star is brighter ~~whereas if the brighter star~~

ii/ Total mass can be determined by ~~the absolute magnitude~~, ~~the vis~~ determining the radius of the orbit & the period of the orbit.

$$\frac{r^3}{T^2} = \frac{GM}{4\pi^2} \quad \text{where } M = m_1 + m_2$$

$$\therefore \frac{4\pi^2 r^3}{T^2 G} = m_1 + m_2 \quad (\text{Solar masses})$$



The radius of the orbit is calculated from the centre of mass of the 2 stars.

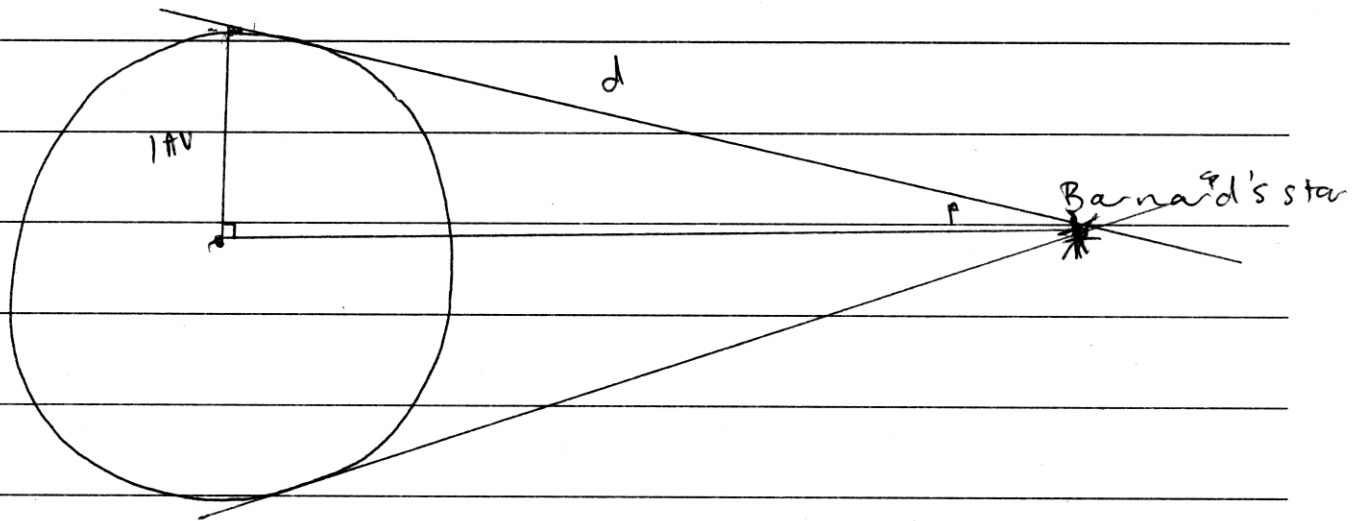
b) Lalande 21185

$$\frac{I_A}{I_B} = 100 \frac{(m_B - m_A)}{5}$$

$$\frac{I_A}{I_B} = 100 \frac{11.01 - 10.37}{5}$$

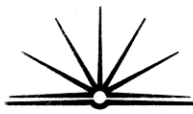
$$\frac{I_A}{I_B} = 1.803 \dots$$

\therefore Ross 154 = 1.8 times brighter (1 dp).



ci/ S. They are quite ~~or~~ fairly hot have a fairly high surface temp and are small stars \therefore have low solar luminosities.

ii/ There is no nuclear source / energy. They eventually loose their brightness & become brown dwarfs



iii/ The hydrogen burns up to create helium. The hydrogen burns up in the inner core of the star creating it to expand & move on its cycle ~~where it then~~ where it shrinks and loses its nuclear energy source becoming a white dwarf.

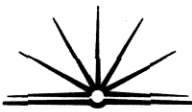
d/ ~~adaptive optics use fast track systems to improve the atmospheric turbulence involved with telescope~~
The development of adaptive optics has allowed for improved atmospheric turbulence involved with ~~ground-telescopes~~ ground based telescopes. Adaptive uses a fast track system with a wavefront sensor, a wavefront correction device & a computer aid to quickly detect &



fix the problems associating with atmospheric turbulence that cause problems with resolution & sensitivity. The wavefront sensors detect the faults in the atmosphere surrounding the wave before it reaches the telescope & filters the errors using its fast track correction device to improve sensitivity.

~~Interometry~~ The development of interferometry has ~~noted~~ also improved resolution & sensitivity of ground based astronomy.

Interferometry uses an array of telescopes to detect the same source & the interference patterns gathered by the 2 or more telescopes are compared. ~~By using more than one mirror the distance between the mirrors the resolution~~



~~would be equal to that~~ The distance between the 2 mirrors gives out the same resolution as from the 2 telescopes give out the equivalent resolution as a mirror with the diameter equal to that distance. ∴ By using interferometry resolution is improved without creating enormous telescopes.

These two developments have improved resolution & sensitivity in that they have led way to new generational telescopes where the apertures have been large enough to ~~xxx~~ increase sensitivity & ^{resolution} ~~xxx~~

By a considerable amount & by using correction systems the ~~resolution~~ ability to distinguish two close sources are higher.