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Question 30 - ASTROPHYSICS!

a) i)

Observations made by astronomers to determine Algol is an eclipsing binary can be the movement the star is moving and the magnitude of the star. To see whether at some stages it is half the magnitude to some other stages. (meaning overlapping of other stars)

ii) Total mass of a binary star system, can be determined by the measurement of their absolute magnitude and apparent magnitude. And by using these measurements you can use Kepler's Law to determine the mas of the stars,

formulas: $m_1 + m_2 = \frac{4\pi^2 r^3}{GT^2}$ & $\frac{r^3}{T^2} = \frac{Gm}{4\pi^2}$.

and by rearranging the formulas and putting m as subject, then it would be more easier to calculate.

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b) i) the star that is most blue in colour is Lalande 21185

ii)

(HOW MUCH BRIGHTER ROSS 154 - Proxima Centauri)

$m = m - 5\log\left(\frac{d}{10}\right)$ (← formula used to determine.)

Proxima Centauri

$$11.01 = m - 5\log\left(\frac{1}{\frac{1.29}{10}}\right)$$

$$m = 11.01 + 5\log\left(\frac{1}{12.9}\right)$$

$$= 30.645392 87.$$

ROSS 154

$$10.37 = m - 5\log\left(\frac{1}{\frac{2.97}{10}}\right)$$

$$m = 10.37 + 5\log\left(\frac{1}{29.7}\right)$$

$$= -6.585735229.$$

ROSS 154 is 37 times brighter than Proxima Centauri.

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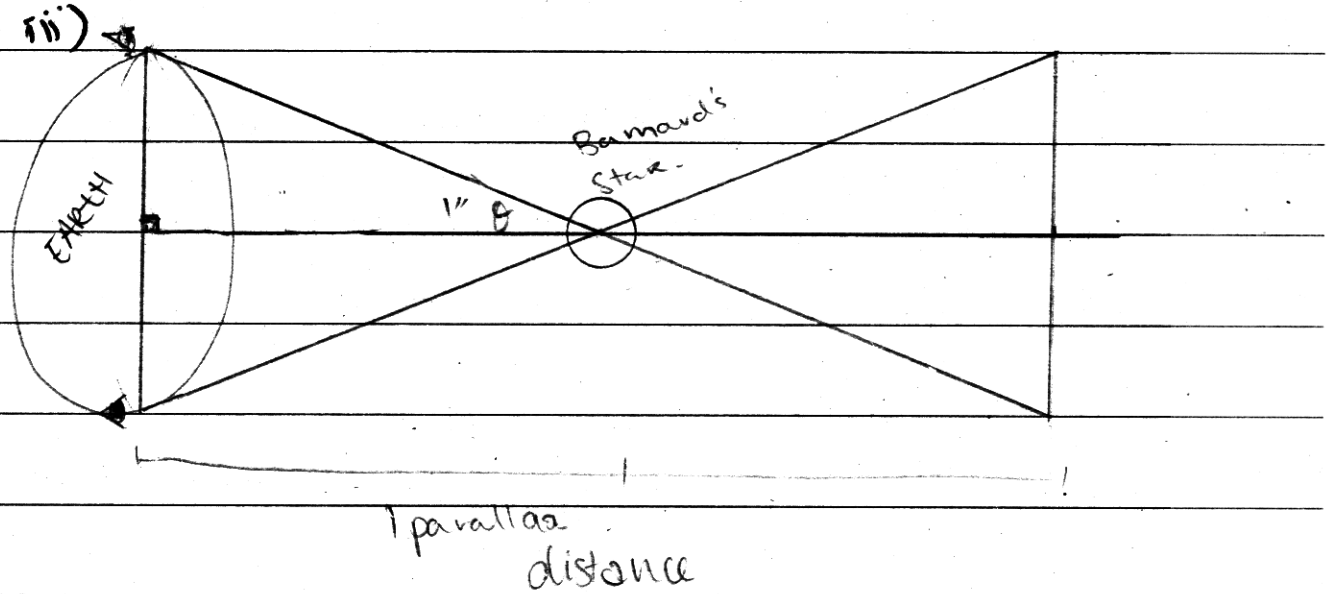
b) (continue)

iii)



c) On the H-R diagram the white dwarfs would be found in position 'S'. It has the ~~highest~~ lowest average luminosity and ~~lowest~~ surface temperature. ~~because it is a dying star.~~

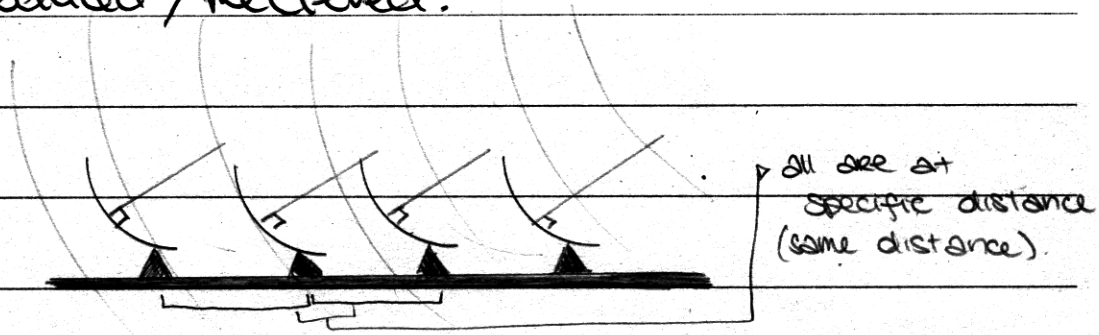
ii) A white dwarf does not continue to shrink in size because it is not a new born star or a dying star therefore it is at its mature stage where nothing is happening to it. Therefore it does not continue to shrink.

iii) a nuclear reaction that would take place on the main sequence would be because it is dying out and that it is too big &, hence it collapses on itself. Causing a fission to happen therefore, a blow of radiation.

d) ~~The way that adaptive optics and the development adaptive optics and interferometry~~

The development of adaptive optics and interferometry have improved the resolution and sensitivity of ground based astronomy because it has allowed more accurate readings for astronomers to use and to produce better images that allow them to have a better understanding of the galaxy.

Adaptive optics allows justifications and modifications to be made to suit the needs of telescopes and interferometry allows better frequency / waves to be produced / recieved.



∴ it can calculate more accurately.
ground base
and since usually all recording are done on top of mountain tops, there is always less frequency interference, or interference with the city lights or antiation. Therefore, it wouldn't effect the ~~reading~~ astronomers. However, these have helped resolutions and sensitivity of ground based astronomy because they have allowed more accurate readings for astronomers to use in their calculations. Because if they have ~~more~~ better resolution and sensitivity, the astronomers would be able to produce better images where they can

compare and contrast so that they can find out the stars magnitude and luminousity or to see if their are more new stars that they have missed. or whether how far away these stars are from the Earth.