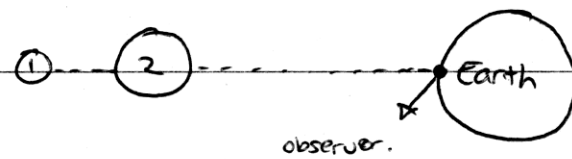
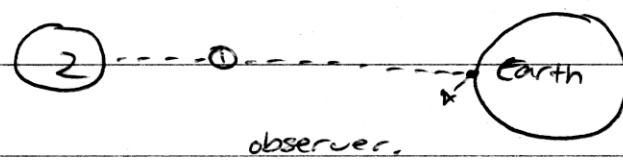
a i) To identify an eclipsing binary star an observer must see the star change in size/brightness when the two stars line up with the earth. ie.





This will identify a binary star system.

ii) By learning of a Binary star systems time period of orbit and the orbital radius the total mass can be calculated, through the use of the equation. $M_1 + M_2 = \frac{4\pi^2 r^3}{GT^2}$

They are important in determining stellar masses because they give observers the chance to compare them to other unknown stars.

b) PTO :

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b) i) Lalande 21185 is more blue.

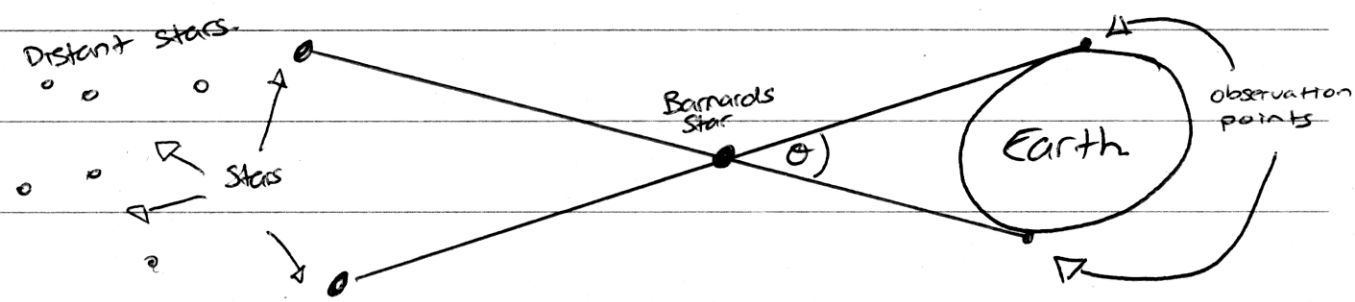
ii) $\frac{I_A}{I_B} = 100^{(11.01 - 10.87)/5}$

$= 100^{0.128}$

$= 1.803$

Ross 154 is 1.803 times brighter than ~~Alpha~~ Proxima Centauri.

iii)



c) i) Star "S" is a white dwarf ~~star~~ which is indicated from its very high surface temperature but its dull solar luminosity

ii) A white dwarf cannot shrink in size any more because the gravitational field around it has

already collapsed it ~~esca~~ to making it very dense, it is also only burning Helium as in its fusion reaction, making it very stable and small.

iii) For a star on the main sequence at the core of it there is a Hydrogen fusion reaction in which it is being fused causing great energy and heat. Making the star extremely bright.

d) Adaptive optics in ground based telescopes have benefitted ~~sp~~stellar observation greaterly because it allows the observers to form a collection mirror to suit the incoming waves which are almost always corrupted from the earths atmosphere. This improves the sensitivity and resolution of incoming pictures because it cancels out alot of the disruption through the use of computers. The development of

interferometry has seen stellar observertors access to clearer pictures still. The technology of linking two or more telescopes up focused at the same position in the sky and then comparing the data and getting an interference pattern a clearer picture can be formulated by computers.

The development of super cooling collection plates has added to better sensitivity in ground based telescopes because it makes the telescope use less energy and is able to pick up finer details of radiation coming from the stars.

These 3 techniques all improve the resolution and sensitivity of ground based telescopes, however ground based telescopes will always be restricted in what they are able to detect.