

Assignmentqq

[Science](#), [Physics](#)



Astronomy 122 Third Homework Template Stellar Parallax: Enter your answers to the questions below in the provided table (the response cell will expand with your typing)

Question:

Your Response

a) What are the angles for GL 244 and GL 171. 1

GL171. 1- 0. 05

GL2441 - 0. 35

b) Which one of these two stars has the more accurate determination of the parallax and why?

GL171. 1 . The measuring scale is smaller and thus gives a smaller margin of error. IN addition, the distance AB is smaller than in the case of GL244.

c) Explain selecting only the brightest stars in the sky for parallax measurements would give you a biased sample

Light from bright stars is not easily distorted by background light from other stars thus leading to more accurate readings for parallax.

2. Explain why stars are unstable (that means their Radius changes) when they are not generating energy in their cores:

In a process called stellar evolution, stars use up all their hydrogen fuel, turning it into helium. Stars become giants and super giants.

3. For low mass stars, the relation between their luminosity (intrinsic energy output) and their mass is the following:

Which means luminosity is proportional to Mass to the 4th power. The main sequence lifetime of a star is found by its Mass (fuel) divided by the rate of fuel burn (Luminosity); hence lifetime = M/L where M and L are measured in

solar units. A one solar mass star with one solar luminosity has $M/L = 1/1 = 1$. The main sequence lifetime of a one solar star is 10 billion years. From that information answer the following and show all work.

Question:

Your Response

a) What is the luminosity of a 5 solar mass star compared to a 1 solar mass star?

b) What is M/L for a two solar mass star?

c) What is M/L for a 0.5 solar mass star?

d) What is the main sequence lifetime of a 10 solar mass star?

e) What is the main sequence lifetime of a $\frac{1}{2}$ solar mass star?

4. In this exercise, you will be measuring the equivalent widths of absorption lines in

real spectra of real stars using a simulation - make sure you access the video tutorial. If you don't watch the tutorial, you will be lost - guaranteed.

Comparing the Hydrogen Line Strength of two different stars:

Question:

Your Response

a) From the list under step 1 choose the star type labeled A5-7V and measure the equivalent width of the Hydrogen line at 4860 angstroms

14.4

b) Now make the same measurement of the star G8IV

4.5

c) Explain why this measurement was more difficult for the G star compared to the A star

The G-Star is less brighter than the A-star thus the reading is affected greatly by background stars.

5. Stars are often born in stellar clusters. You will need to download the Red and Blue images of a simulated stellar cluster (see downloads above). Below are two simulated images to a cluster, one is taken in Blue light and one is taken in Red light.

There are 31 stars in this cluster. Extremely blue stars would be much brighter in the blue frame than the red frame whereas extremely red stars would be much brighter in the red frame than the blue frame. Use a 30 second exposure time for the red and blue images and answer the questions below:

Question:

Your Response

a) Identify by star number, three blue stars

8, 29, 31

b) Identify by star number, four red stars

16, 9, 7

c) Identify by star number, five stars that appear of equal brightness in the two frames.

17, 4, 1, 5, 3