Name: .....

ASTRONOMY 1102 - Section 1

Instructor: Juhan Frank

Spring 1998

Homework # 4 due Fri. Feb. 26

Main Sequence and Variable Stars

1) A B3V star has a mass of approximately 10 $M_\odot$. Estimate its luminosity in solar luminosities $L_\odot$, using the approximate mass-luminosity relationship discussed in class: $L \propto M^3$. Then use Fig.25-7 to get an estimate for the luminosity using absolute magnitudes. Compare.

2) Using the Mass-Radius relationship discussed in class $R \propto M$, estimate the radii of a 5 $M_\odot$ and of a 0.5 $M_\odot$ star. Which is densest on average?
In other words, if I take a cubic inch of material from the center of each star , which is likely to contain more mass? HINT: average density = mass/volume.

3) A cepheid of period 50 days is observed by the Hubble Space Telescope to oscillate around an apparent magnitude of 24 in a distant spiral galaxy.
How far is that galaxy approximately? HINT: use Fig. 25-11.