ASTR 220 Homework #5

Spring 2005

Due Tuesday, April 5, 2005, *at the beginning of lecture.*

All of the textbook questions are from *The Essential Cosmic Perspective.*
Please neatly write or type your homework.
Be aware of potential plagiarism: make sure to put the answer into your own words. Feel free to discuss the questions with your classmates, but write up the answers yourself - do not copy.
Make sure to show your work for any calculations - answers that appear like magic will receive no credit.

1. Ch. 5, Does It Make Sense, #18.
2. Ch. 5, Problems, #31.
3. Suppose a star has a surface temperature of 20,000 K.
   (a) What is the wavelength at the peak of the star's thermal radiation curve?
   (b) What type of light is this? (Such as radio, visible, etc.)
4. Suppose we observe a star with a hydrogen absorption line in the red part of the star's spectrum. In the star's spectrum, the line has a wavelength of $6.565 \times 10^{-7} m$. However, in the laboratory, we measure the wavelength of this line to be $6.563 \times 10^{-7} m$.
   (a) What is the shift in the wavelength of the spectral line?
   (b) What is the velocity of the star?
   (c) Is the star moving toward us or away from us?
5. Ch. 10, Sensible Statements, #18.
6. Ch. 10, Sensible Statements, #19.
7. Ch. 10, Review Questions, #2.
8. Ch. 10, Review Questions, #4. Only do the layers from the core up to (and including) the photosphere.
9. Explain why fusion in the Sun only occurs in the core and not in the outer layers or surface.
10. When we observe the Sun through a spectroscope, we see an absorption spectrum. However, if we observe **only** the Sun's **atmosphere** through a spectroscope (during a solar eclipse), we see an emission spectrum. Explain why we see two different kinds of spectra, even though we are looking at the Sun in both cases. Relate your explanation to how each type of spectrum is created.