Discussion Problems

1. (a) The flux of two stars differ by a factor of 10. What is the difference in their magnitudes?

   (b) The brighter star has an apparent magnitude of 10. What, if anything, does that tell you about the other star?

   (c) If the brighter star is found to have a parallax of $0.01''$, can you calculate the absolute magnitude of the other star? (Do so if you can.)

   (d) What is the distance modulus to either or both stars?

2. (a) In the Vega magnitude system, consider a star that is hotter than Vega. What can you say about the magnitudes of this star?

   (b) In an eclipsing binary system with two stars of different radii but the same temperature, what will their light curve look like? Draw it.

   (c) If the stars have different temperatures, how would the light curve change? (HINT: $L = 4\pi R^2 \sigma_{\mathrm{SB}} T^4$)