

**Problems for Tutorial Week #5**  
*Photometry*

**Chromey Ch. 9: 5-7 and Ch 10: 6, 12**

Additional Problem:

The shape of stellar images on a given CCD frame is set by a combination of the atmospheric conditions at the time of observation and the optical properties of the telescope and camera. This shape is called the *point spread function*, or PSF, of the image. The PSF is typically fairly well fit by a Gaussian, and in a given image each star has the same PSF (i.e. same  $\sigma$  in the Gaussian) but with different peak amplitudes for stars of different brightnesses. Show mathematically that a circular aperture of any fixed radius will encompass the same percentage of the total light from stars of all brightnesses in a given image. This critical fact is what allows us to do aperture photometry.