This is a short problem set, so it is due on Tuesday as usual despite the turkey.

1) Use the equation of hydrostatic equilibrium in the vertical direction to obtain the disk density profile as function of the hight above the midplane. Assume the disk is isothermal with a temperature T. Compare that with the order of magnitude estimate we had in class. Also, compare it to the density profile of an isothermal photosphere of a planet. Why is the functional dependence different?

2) Repeat the derivation in class for the dust temperature and the interior temperature as function of the distance from the star. Keep all coefficient so you can get actual numbers. You may assume $\beta = 1$, and the same approximation we had where the size of the dust particles is just right to absorb to stellar radiation. First assume that the interior is optically thick. Then find out to what distance is this true, if the surface density of the disk is 10^3 g/cm^3 at 1AU and scales as $a^{-3/2}$? What would be the internal temperature beyond that point? Where would the interior become optically thin even to the radiation arriving from the thin dust surface layer? What would be the temperature scaling beyond this point? Calculate H/a and the νL_ν spectrum emitted from the interior in all three regimes.

3) What would be the observational evidence of a truncated inner disk? Give a relation from which one can calculate the inner radius of the disk.