% Homework #2, Problem #2, Physics 262

%Define parameters

par.rhoc0 = 4.46e3; % present critical density

par.rhom0 = 0.28 \* par.rhoc0; % present mass density

par.rhor0 = 0.260; % present radiation density

par.rhoL0 = 0.72 \* par.rhoc0; % present cosmological constant density

% Plotting rho(a) (problem 2.2)

% note that the various rho\_i functions are defined in rhe rhom.m, rhor.m, and

% rhol.m files (attached)

a = logspace(-6,0); % creates "a" values for the x axis

y1=rhor(a,par);

y2=rhom(a,par);

y3=rhol(a,par);

loglog(a,y1,'k-');

hold on

loglog(a,y2,'k:');

loglog(a,y3,'k-.');

hold off

%plot values

xlabel('log(a)')

ylabel('log(\rho )')

title('Log-Log Plot for Problem #2 of Hw #2 in Phys 262')

legend('\rho\_r','\rho\_m','\rho\_{\Lambda}')

% rhol.m

function y = rhol(a,par)

y = par.rhoL0\*a.^(0)

% rhom.m

function y = rhom(a,par)

y = par.rhom0\*a.^(-3)

% rhor.m

function y = rhor(a,par)

y = par.rhor0\*a.^(-4)