

5. Neglecting the curvature constant ($k = 0$), when the equation of state is given by $p = w\rho$, show that the energy density and the scale factor scale as

$$\rho \propto R^{-3(1+w)}, \quad (8)$$

$$R \propto t^{2/3(1+w)}. \quad (9)$$

6. Compute the number density, energy density and pressure for relativistic particles and those for non-relativistic particles.