1.   What is the power P (dimension $M\,L^2\,T^{-3}$) that is required to keep a vehicle of length d and mass m moving at a constant speed v?
     a) Use dimensional analysis to calculate the power P.
     b) Rewrite your result in terms of the kinetic energy $K = m\,v^2/2$, and the characteristic time scale $\tau = d/v$.

2.   The hydrostatic pressure of blood in humans is a part of the total blood pressure. The hydrostatic pressure P (dimension $M\,L^{-1}\,T^{-2}$) is considered to depend on the blood density ρ (dimension $M\,L^{-3}$), the height h of the blood column between the heart and some lower point in the body, and the gravity acceleration g (dimension $L\,T^{-2}$).
     a) Use dimensional analysis to calculate the hydrostatic pressure P.
     b) Pressure is defined as force per area. Rewrite your result for P by taking reference to the gravity force $F_g = m\,g$ and an area A that you have to define conveniently.

3.   For laminar flow in a pipe, the volume flow rate q (dimension $L^3\,T^{-1}$) is a function of the pipe radius r, the viscosity μ (dimension $M\,L^{-1}T^{-1}$) of the fluid, and the pressure drop per unit length dp / dz (dimension $M\,L^{-2}\,T^{-2}$).
     a) Use dimensional analysis to calculate the flow rate q.
     b) How does q change if the radius is increased by a factor of two?