Density of Compressed Liquid.

If a liquid of density ρ, volume V and bulk modulus K is compressed, then its density increases.

As density $\rho = \dfrac{m}{V}$ so $\dfrac{\Delta\rho}{\rho} = \dfrac{-\Delta V}{V}$ .....(i)

But by definition of bulk modulus $K = \dfrac{-V\Delta P}{\Delta V} \Rightarrow -\dfrac{\Delta V}{V} = \dfrac{\Delta P}{K}$ .....(ii)

From (i) and (ii) $\dfrac{\Delta\rho}{\rho} = \dfrac{\rho' - \rho}{\rho} = \dfrac{\Delta P}{K}$ [As $\Delta\rho = \rho' - \rho$]

or $\rho' = \rho\left[1 + \dfrac{\Delta P}{K}\right] = \rho[1 + C\Delta P]$ $\left[\text{As } \dfrac{1}{K} = C\right]$