SC1238

1. a) $5\,cm^3 \times 4\times10^{17}\,kg/m^3 \times \frac{m^3}{1000000\,cm^3} \times \frac{1\text{ tonne}}{1000\,kg}$

$= 2.0\times10^{9}$ tonne

b) $2.0\times10^{9}\text{ tonne} \times \frac{1000\,kg}{\text{tonne}} \div \frac{m^3}{2650\,kg}$

$= 7.5\times10^{8}\,m^3$

3. a) $r = 10$

$V_c \approx 360\,km/s$

$$M = \frac{(360\,km/s)^2(10\,kpc)(3.086\times10^{16}\,km/kpc)\left(\frac{1000000\,m}{km^2}\right)\left(\frac{1\,M_\odot}{1.9891\times10^{30}}\right)}{6.67\times10^{-11}}$$

$= 3.0\times10^{8}\,M_\odot$

Rest using excel