1. $k_F = (3\pi^2 n)^{1/3}$
2. $E_F = \dfrac{p_F^2}{2m} = \dfrac{\hbar^2}{2m}(3\pi^2 n)^{2/3}$
3. $\rho(E) = \dfrac{V\sqrt{2}}{\pi^2\hbar^3} m^{3/2}\sqrt{E}$
4. $N = \displaystyle\int_0^{E_F} \mathrm{d}E\, \rho(E)$
5. $\rho(E_F) = \dfrac{3}{2}\dfrac{N}{E_F}$
6. $N_C \approx \rho(E_F)(k_B T) \sim N\dfrac{k_B T}{E_F}$