Equations:

$$G = E - TS \qquad\qquad S = k_B \log W$$

$$p(E_i) = \frac{w_i e^{-E_i/k_B T}}{\sum_j w_j e^{-E_j/k_B T}} \qquad \langle x \rangle = \sum_i x_i p(x_i) \qquad \langle x^2 \rangle = \sum_i x_i^2 p(x_i)$$

$$\binom{N}{n} = \frac{N!}{n!(N-n)!} \qquad\qquad E_b = \frac{k_B T \, \xi_p \, L}{2 R^2}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad E = -\frac{dV}{dx} \qquad \vec{F} = q \vec{E} \qquad V = \frac{1}{4 \pi \epsilon} \frac{Q}{r}$$

$$\langle R^2 \rangle = N a^2 \qquad\qquad \langle x^2 \rangle = 2 D t$$

$$c = 6 \pi \eta R \qquad\qquad \mathfrak{R} = \frac{v R \rho}{\eta} \qquad\qquad q = C \, \Delta V \qquad\qquad I = g \, \Delta V \qquad\qquad V_N = \frac{k_B T}{e} \log\left(\frac{c_o}{c_i} \right)$$

Physical Constants

$$k_B = 1.38 \times 10^{-23} \, m^2 \, kg \, s^{-2} \, K^{-1} \qquad\qquad \epsilon_0 = 8.85 \times 10^{-12} \, m^{-3} \, kg^{-1} \, s^4 \, A^2$$

$$e = 1.6 \times 10^{-19} \, C$$

$$k_B T = 4.1 \, pN \, nm = 25 \, meV$$