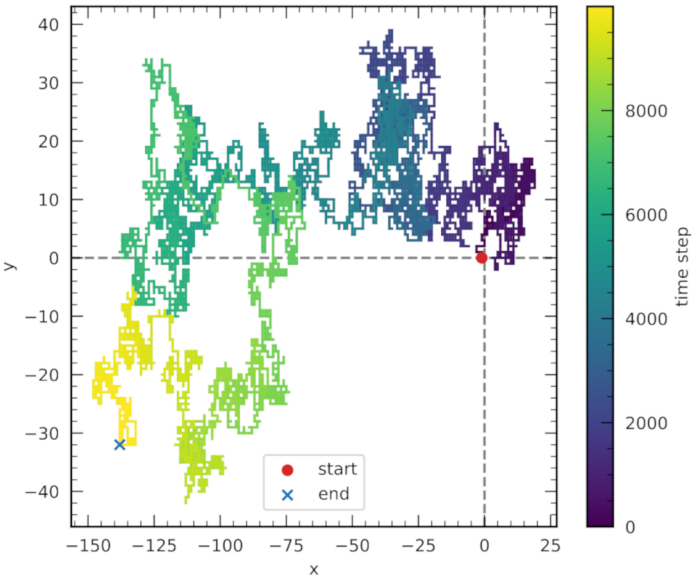
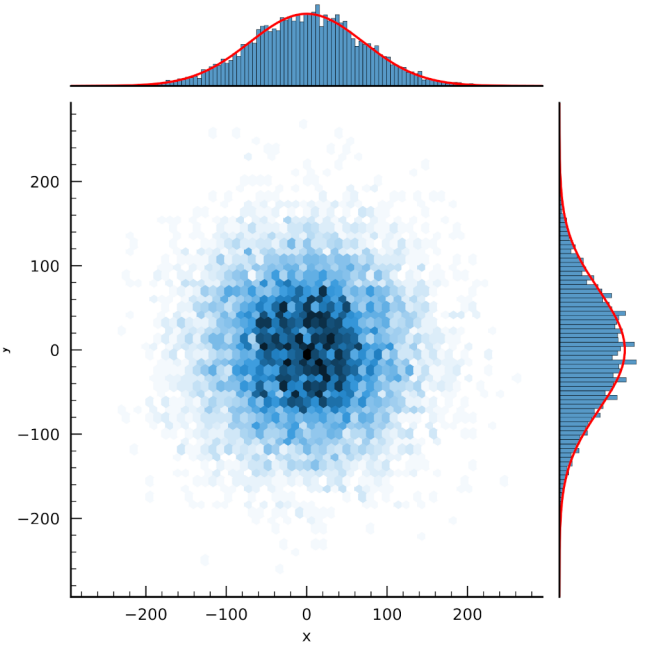
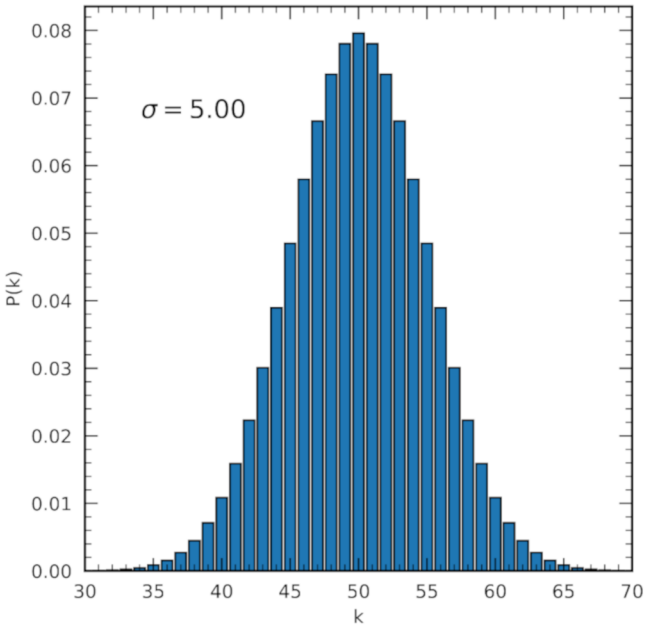
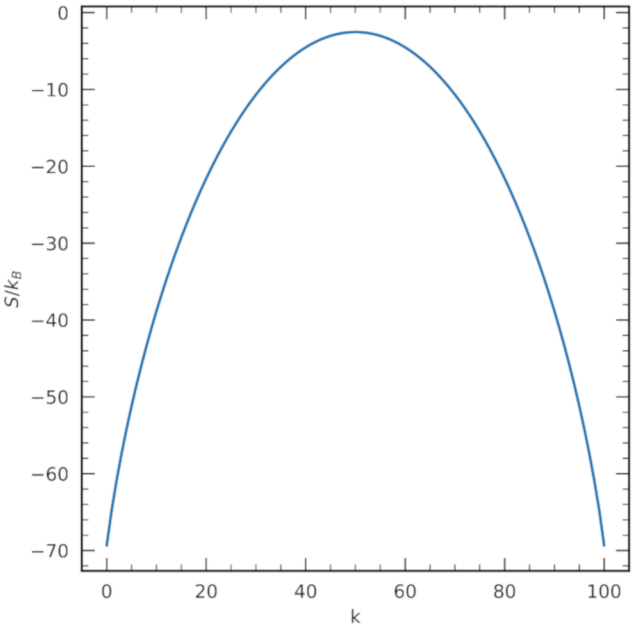
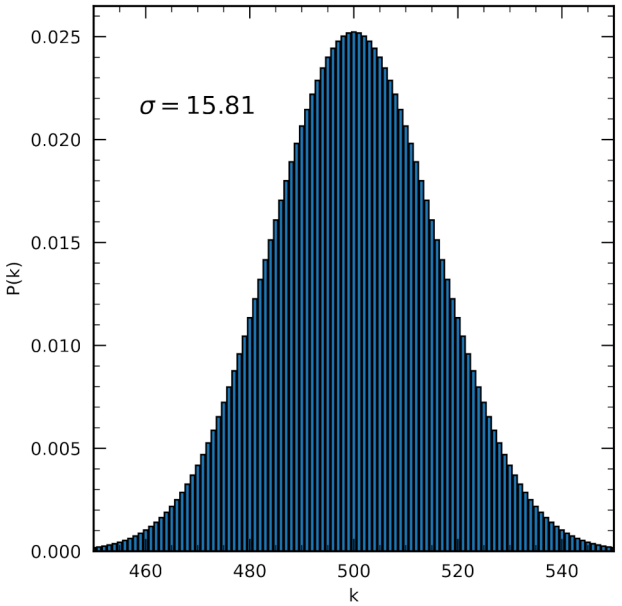
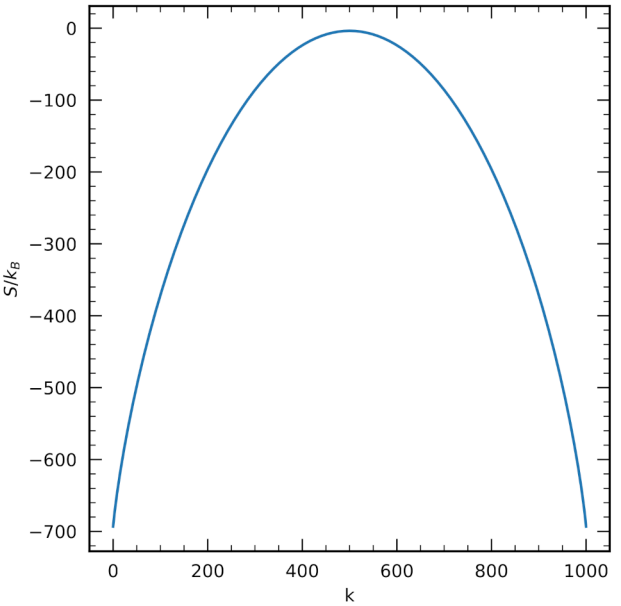

start
end
x
y
time step


x


$\sigma = 5.00$
P(k)
k


S/k_B
k


$\sigma = 15.81$
P(k)
k


S/k_B
k

$$E_n = \frac{\hbar^2}{2m}\sum_{i=1}^{d} k_i^2 = \frac{\hbar^2}{2m}\sum_{i=1}^{d}\left(\frac{\pi}{L}\right)^2 n_i^2$$

in k-Space: $V_k = \left(\frac{\pi}{L}\right)^d$

$$g(k) = \frac{1}{V_k} \quad \text{(dos)}$$

$$Z(k) = \frac{1}{V_k}\cdot \underbrace{2}_{\text{Spin}} \cdot \underbrace{\frac{1}{2^d}}_{\text{double counting of states}} \cdot V(k) \qquad V(k) = \begin{cases} k & d=1 \\ \pi k^2 & d=2 \\ \frac{4}{3}\pi k^3 & d=3 \end{cases}$$

$$k = \frac{\sqrt{2mE}}{\hbar} \Rightarrow Z(E) = \frac{V(E)}{V_k}\,\frac{1}{2^{d-1}}$$

$\underline{d=1}$: $Z(E) = \frac{\sqrt{2mE}\,L}{\pi\hbar}$ $\qquad$ $\underline{d=2}$: $Z(E) = \frac{2mE\,L^2}{\pi\hbar^2} = \underline{\underline{\frac{mEL^2}{\pi\hbar^2}}}$ $\qquad$ $\underline{d=3}$: $Z(E) = \frac{(2mE)^{\frac{3}{2}}\,L^3\,\frac{4}{3}\pi^3}{4\pi^3\hbar^3} = \underline{\underline{\left(\frac{\sqrt{2m}\,L}{\hbar}\right)^3 \frac{1}{3}(E)^{\frac{3}{2}}}}$

$$Z(1\text{eV}) = \begin{cases} 8.63 & d=1 \\ 116.98 & d=2 \\ 6641.98 & d=3 \end{cases}$$

$$g(E) = \frac{1}{L}\frac{\partial Z(E)}{\partial E} = \begin{cases} \frac{\sqrt{2m}\,L}{\pi\hbar\sqrt{E}} & d=1 \\ \frac{mL^2}{\pi\hbar^2} & d=2 \\ \left(\frac{\sqrt{2m}\,L}{\hbar}\right)^3 \frac{\sqrt{E}}{2} & d=3 \end{cases}$$

(diskretisiert mit dE, anstatt 0,1 eV)

4) $W = \begin{pmatrix} 0.9 & 0.1 \\ 0.7 & 0.3 \end{pmatrix} \qquad P_0 = (1, 0)$

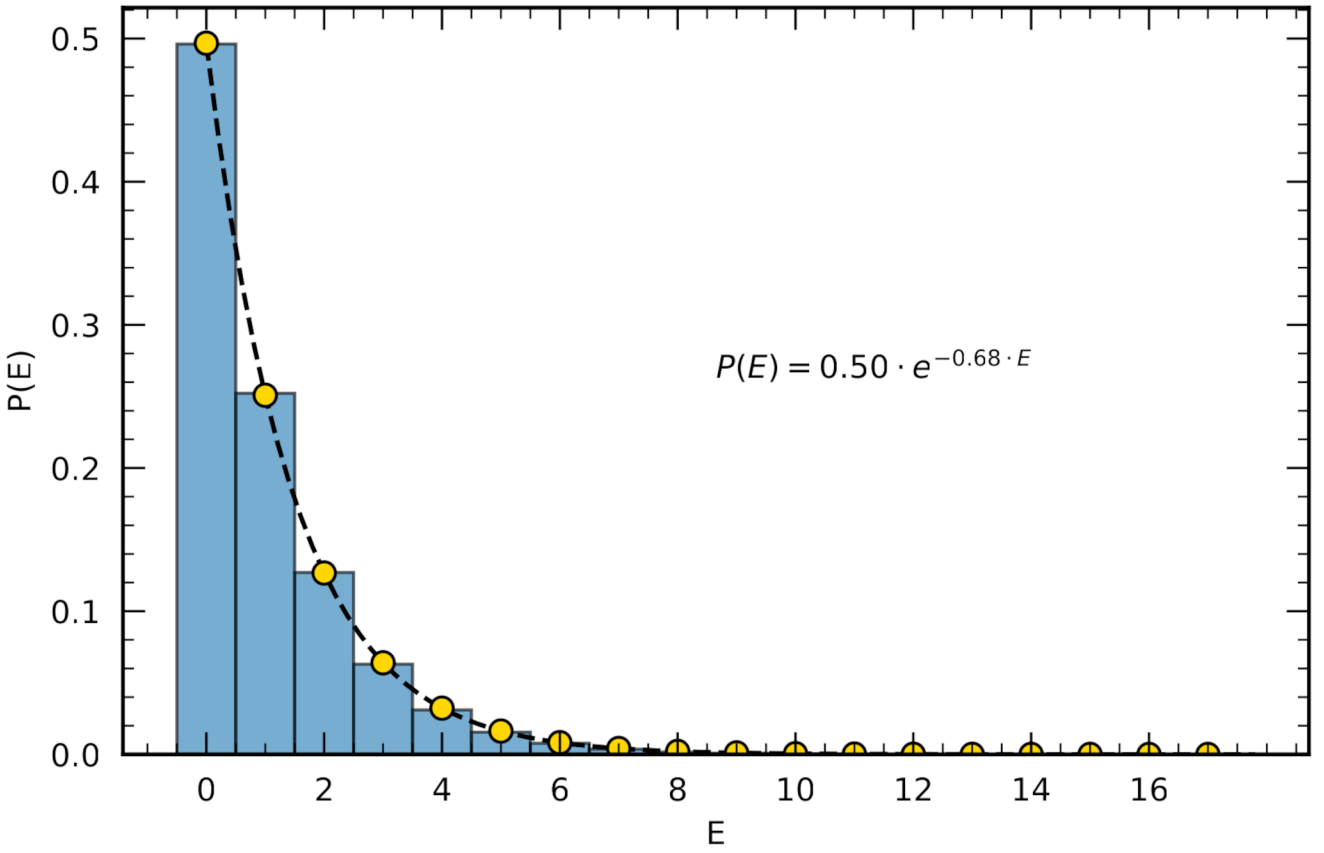
$P_5 = P_0 W^5 = \cancel{(0.875, 0.125)}\ (0.769, 0.231) \Rightarrow P = 76.9\%$

b) $P_5 = (0, 1) W^5 = (0.692, 0.308) \Rightarrow P = 69.2\%$

c) $(1,0) W^{10} = (0.751512, 0.248488) \qquad (0,1) W^{10} = (0.745465, 0.254535)$

$\Rightarrow (1,0) W^{\infty} = (0,1) W^{\infty} \rightsquigarrow (0.75, 0.25)$

d) $200 \cdot 0.25 + 50 \cdot 0.75 = 50\left(1 + \frac{3}{4}\right) = 162.5$


0.5
0.4
0.3
0.2
0.1
0.0
P(E)
$P(E) = 0.50 \cdot e^{-0.68 \cdot E}$
0
2
4
6
8
10
12
14
16
E