#6 a) $\langle f(x) f(x+dx) \rangle = N - \frac{nx}{2} = g(x)$ $g(K) - \int_{-\infty}^{\infty} z_{\pi}ivx_{N} \left(N - \frac{nx}{2}\right) dx$ $= \int_{-\infty}^{\infty} (2\pi i N_{n}x + N_{n}^{2} - 4\pi i N_{n}^{2}x)e^{-2\pi i N_{n}x}$ $= \frac{k^{2}}{2\pi i N_{n}x + N_{n}^{2}} - \frac{nx}{2\pi i N_{n}^{2}x} e^{-2\pi i N_{n}^{2}x}$