2)
1. we gaan eerst van x- space naar k-space
2. we vinden de oplossing in de k-space.
3. we transformeren terug naar x-space

$$\partial_t \varphi(x,t) = \tilde{D}\cdot\partial_x^2 \varphi(x,t) - k^2 \tilde{D}\varphi(x,t)$$

$$\rightarrow \varphi(x,t) = \frac{1}{2\pi}\cdot\int_{-\infty}^{+\infty} \varphi(k,t)\cdot e^{ikx}\cdot dk$$ → inverse fourier transform

we use:

$$\partial_x^2\, \varphi(x,t) \rightarrow -k^2\, \hat{\varphi}(k,t)$$

$$\varphi(x,t) \rightarrow \hat{\varphi}(k,t)$$

$$\rightarrow \partial_t \hat{\varphi}(k,t) = -D\cdot\left[k^2 + k^2\right]\hat{\varphi}(k,t)$$

→ lineaire diff vgl:

$$\hat{\varphi}(k,t) = e^{-Dk^2t}\cdot e^{-Dk^2t}\cdot\hat{\varphi}(k,0)$$

$$n_0\cdot e^{-k^2\frac{\sigma^2}{4}}\cdot\sigma\cdot\sqrt{\pi}$$

invullen terug naar x-space

$$\varphi(x,t) = \frac{n_0\cdot\sigma\cdot\exp(\dots)}{\sqrt{4dt+\sigma^2}}$$