Differential equations. Quiz 2. **Name:** **Neptun:**

1. Let $e_1 = \left(\frac{\sqrt{3}i}{2}, \frac{1}{2}\right)^T$, $e_2 = \left(\frac{1}{2}, \frac{\sqrt{3}i}{2}\right)^T$ be an othonormed basis in $\mathbb{C}^2$ and let $u = (3+i, 4-2i)^T$, $u = \alpha_1 e_1 + \alpha_2 e_2$. Compute α_2 !
2. The characteristic function χ_D is defined as $\chi_D(x) = 0$ if $x \notin D$, otherwise $\chi_D(x) = 1$. Let $f(x) = \chi_{[-2,2]}(x)$, $f(x) = \sum_{n\in\mathbb{Z}} \hat{f}_n \frac{e^{inx}}{\sqrt{2\pi}}$. Compute $\hat{f}_9$!
3. $\partial_t \phi(t,x) = \partial_{xx}\phi(t,x)$, $\phi(0,x) = \cos(3\pi x) + 4\cos(5\pi x)$. Compute $\phi(t,x)$!