## M526/P623 Quantum Computation

## Lecturer: Ninnat Dangniam

## Homework Assignment 5

DUE: 10 Feb 2025 40 points

1. Diffusion in the Fourier basis (10 points): MM 15.35

2. Flip around the average (10 points): MM 15.36

3. Unknown number of solutions (10 points): MM 15.37

**4. Collision problem (10 points)**: MM 15.38

(You don't need to do the first part that asks for a classical  $\mathcal{O}(\sqrt{N})$  algorithm since we already discussed it in the context of Simon's problem.)