

1. Find the Quantum Fourier transform of

$$\frac{1}{2}(|0\rangle + |1\rangle + |2\rangle + |3\rangle)$$

2

2. What is the period of  $11 \bmod 15$ ?

1

3. Find the probability of failure of the Grover's algorithm to identify the marked state in a database of 16 items after a single (i.e. 1) iteration.

2