1. Compute the probability of 0 and 1 for the following state:

\[ \frac{\sqrt{2}}{\sqrt{5}} |0\rangle + \frac{\sqrt{3} \cdot i}{\sqrt{5}} |1\rangle. \]

Check that it is a physically valid state.

2. Describe the conjunction operation & as a Toffoli gate; write down the truth table for this gate.