Quantum Information B Fall 2020 Problem Set 4

Solutions are due in 4 pm on Tuesday Nov 24.
All problems are taken from Nielsen-Chuang, look them up from the book.

1. Exercise 9.7 from the book.

2. Exercise 9.9 from the book. For example, an *unital channel* had the property of mapping an identity matrix to an identity matrix $\mathcal{E}(\mathbf{I}) = \mathbf{I}$, so that its fixed point is the maximally mixed density matrix $\rho_{mm} = \mathbf{I}/d$ where d is the dimension of the system Hilbert space.

3. Exercise 9.12 from the book.

4. Exercise 9.22 from the book. Hint: it may be useful to use the triangle inequality.

5. Exercise 10.1 from the book.

6. Exercise 10.2 from the book.

Reading for this and next week: Read Chapter 10, up to p. 467 if you can.