

Exercises for nonlocality, entanglement und geometry of
quantum systems
Sheet 8

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Exercise 21

Show that

$$\sigma_x \otimes \sigma_x \otimes \sigma_x = -(\sigma_x \otimes \sigma_y \otimes \sigma_y) \cdot (\sigma_y \otimes \sigma_x \otimes \sigma_y) \cdot (\sigma_y \otimes \sigma_y \otimes \sigma_x)$$

Exercise 22

The GHZ state is

$$|GHZ\rangle = \frac{1}{\sqrt{2}}(|0\rangle \otimes |0\rangle \otimes |0\rangle - |1\rangle \otimes |1\rangle \otimes |1\rangle)$$

Construct all states that are orthogonal to this state.

Exercise 23

Is it possible to create a similar argument as the GHZ argument for two qubits? What would be the elements to consider?