

4. (15 pts) State the **Riesz lemma**, which describes the dual space of a (complex) Hilbert space.

5. (10 pts) For a (generally) unbounded operator T on a complex Hilbert space, define the **domain** $\mathcal{D}(T^*)$ **of the adjoint**, and the action of the **adjoint** T^* .

6. (10 pts) For a (generally) unbounded operator on a complex Hilbert space, defined what it means to be **symmetric**, and what it means to be **self-adjoint**.

7. (15 pts) State the **Riesz (or Riesz-Markov-Kakutani) representation theorem**.

8. (15 pts) State the multiplication-operator form of the spectral theorem for self-adjoint operators.

9. (15 pts) State the **bounded Borel functions** form of the **functional calculus** for **self-adjoint operators**.

BLANK SPACE (FULL PAGE)