HOMEWORK 15

Note: $*$ marked problems might be slightly more difficult or interesting than the unmarked ones.

(1) Show that the uniform metric ρ and the ℓ^2-metric d_2 define the same topology on the Hilbert cube H as the product topology. In particular, H is metrizable.

(2) Topology (Munkres), Chapter 4, Section 32, Exercise (5).

(3) Topology (Munkres), Chapter 4, Section 32, Exercise (6). (Note that this problem is not correct as stated in the book, since the definition of normal spaces includes T_1 condition for us and Munkres, so one of the implication directions requires this additional hypothesis. So do take care to add that hypothesis.)

(4)* Topology (Munkres), Chapter 4, Section 32, Exercise (8).

(5)* Topology (Munkres), Chapter 4, Section 32, Exercise (9).

(6) Topology (Munkres), Chapter 4, Section 33, Exercise (1).

(7) Topology (Munkres), Chapter 4, Section 33, Exercise (2).

(8) Topology (Munkres), Chapter 4, Section 33, Exercise (4).

(9) Topology (Munkres), Chapter 4, Section 34, Exercise (1).

(10) Topology (Munkres), Chapter 4, Section 34, Exercise (2).

(11) Topology (Munkres), Chapter 4, Section 34, Exercise (5).

(12) Topology (Munkres), Chapter 4, Section 34, Exercise (7).