HOMEWORK 16

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

(1) Topology (Munkres), Chapter 4, Section 35, Exercise (1).

(2) Topology (Munkres), Chapter 4, Section 35, Exercise (3).

(3) Topology (Munkres), Chapter 4, Section 35, Exercise (4).

(4) Topology (Munkres), Chapter 4, Section 35, Exercise (5).

(5) Topology (Munkres), Chapter 4, Section 35, Exercise (7).

(6)* Show that a topological group G is T_0 if and only if it is T_1 if and only if it is T_2. (In fact you will see a stronger version of this problem in the last problem.)

(7) Show that the following are topological groups.
   (1) $(\mathbb{R}_+, \times)$.
   (2) $(S^1, \times)$.
   (3) $\mathrm{GL}_n(\mathbb{R})$ and $\mathrm{GL}_n(\mathbb{C})$.

(8) Topology (Munkres), Chapter 4, Section 22, Exercise (4).

(9) Topology (Munkres), Chapter 4, Section 22, Exercise (5).

(10) Topology (Munkres), Chapter 4, Section 22, Exercise (7).