

## Exercises

11.20 [10Q] Prerequisites: [10M]. Given  $p \in [1, \infty]$  show the **Minkowski inequality**

$$\|x + y\|_p \leq \|x\|_p + \|y\|_p \quad . \quad (11.20)$$

There follows that  $\|x\|_p$  are norms.

For  $p \in (1, \infty)$  find a simple condition (necessary and sufficient) that involves equality; compare it with [0ZY]; deduce that  $\mathbb{R}^n$ , with the norm  $\|\cdot\|_p$  for  $p \in (1, \infty)$ , is a *strictly convex normed space* (see [0ZZ]).

**Solution 1.** [10R]