

## Math 206 — Open sets

**Problem 1.** Make a conjecture about which of the following are open sets. No proof is needed for now, but I'll ask you to prove your conjecture for some of these on homework.

- a.  $\emptyset$
- b.  $\mathbb{R}$
- c.  $\{1\}$
- d.  $[0, 1)$
- e.  $\bigcap_{n=1}^{10} (1 - 1/n, 1 + 1/n)$
- f.  $\bigcap_{n=1}^{\infty} (1 - 1/n, 1 + 1/n)$

**Problem 2.** Prove or disprove: the intersection of a finite collection of open sets is open.

**Problem 3.** Prove or disprove: the intersection of an infinite collection of open sets is open.