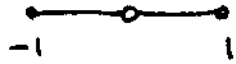


②

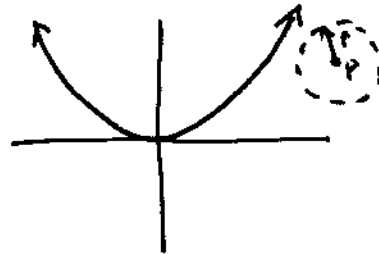
$$(i) \{x \in \mathbb{R} \mid 0 < x^2 \leq 1\} = [-1, 0) \cup (0, 1]$$

i.e.



- this set is not open since ± 1 are not interior points
- this set is not closed since its complement $(-\infty, -1) \cup \{0\} \cup (1, \infty)$ is not open. (0 is not an interior pt)

$$(ii) \{(x, y) \in \mathbb{R}^2 \mid y = x^2\}$$



- this set is closed. Let $p = (x_1, x_2)$ be in its complement and let r be the smallest distance from p to the parabola. (this is positive, can you find a lower bound for this number depending on x_1 and x_2 ?)

Then $U_r(p)$ is in the complement of the parabola.

Hence the complement is open and the parabola is closed.