

1 Esercizi di Topologia, 12 ottobre 2004, M.M.

Esercizio 1. Provare che i seguenti sottoinsiemi del piano \mathbb{R}^2 sono tutti omeomorfi tra loro.

1. $\{(x, y) \mid 0 \leq x, 0 < y\}$.
2. $\{(x, y) \mid 0 < x < 1, 0 \leq y < 1\}$.
3. $\{(x, y) \mid 0 \leq x \leq 1, 0 \leq y < 1\}$.
4. $\{(x, y) \mid 0 \leq x, 0 \leq y\}$.
5. $\{(x, y) \mid 0 \leq x\}$.
6. $\{(x, y) \mid 0 \leq x \leq y\}$.
7. $\{(x, y) \mid x^2 + y^2 \leq 1, x \neq 1\}$.

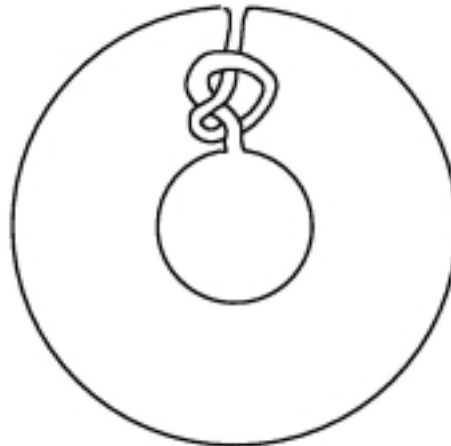
△

Esercizio 2. Arrange the following items to homeomorphism classes: a cup, a saucer, a glass, a spoon, a fork, a knife, a plate, a coin, a nail, a screw, a nut, a wedding ring, a flower pot (with hole in the bottom), a key.¹

△

Esercizio 3 (*).

In a spherical shell one made a hole connecting the boundary spheres and having the shape of a knotted tube (see Figure). Prove that the rest of the shell is homeomorphic to D^3 .



△

¹tazza, piattino, bicchiere, cucchiaio, forchetta, coltello, piatto, moneta, chiodo, vite, dado (di bullone), anello nuziale, vaso da fiori (con il buco in fondo), chiave