

Homework Math 123

April 10, 2008

Let $S = \{(x, y) : |x| \leq 1, |y| \leq 1\}$ and $D = \{(x, y) : x^2 + y^2 \leq 1\}$ denote the square and the disc in the Euclidean plane \mathbb{R}^2 . Prove that S and D can each be decomposed into two disjoint pieces

$$S = S_1 \sqcup S_2 \quad \text{and} \quad D = D_1 \sqcup D_2 \tag{1}$$

so that S_i is similar to D_i for $i = 1, 2$. (Disjoint means that their intersection is empty.)