

PROBLEMS ON EQUIVALENCES

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Let $S := \{(x, y) \in \mathbb{R}^2 : x - y \in \mathbb{Z}\}$.

- (1) Show that S is an equivalence relation.
- (2) Describe the equivalence classes of $3, 0, 3.14, \sqrt{2}$ and of an arbitrary element $x \in \mathbb{R}$ with respect to S .
- (3) How many different equivalence classes with respect to S are there? Can you list exactly one representative $x \in \mathbb{R}$ for each class?