

Work on these with your partner(s) at the board

1. Define the relation S on \mathbb{R} by $x S y$ iff $x - y$ is an integer.
 - (a) List three pairs of real numbers that are in S and three pairs that are not
 - (b) Prove that S is an equivalence relation
 - (c) Describe the distinct equivalence classes of S

2. Let $A = \mathbb{Z} \times (\mathbb{Z} - \{0\})$
Define a relation R on A by $(a, b) R (c, d)$ iff $ad = bc$
 - (a) Show that $(6, 4) R (9, 6)$
 - (b) Give three additional pairs from A that are related by R
 - (c) Give three pairs from A that are *not* related by R
 - (d) Prove that R is an equivalence relation
 - (e) Describe all elements in the equivalence class of $(3, 2)$
 - (f) Describe the distinct equivalence classes of R

based on Epp, Example 8.3.12