

**MATH 113: DISCRETE STRUCTURES
HOMEWORK FOR MONDAY WEEK 3**

Problem 1. Suppose that $f : A \rightarrow B$ is a surjective function. Define a relation \approx_f on A so that $a \approx_f b$ if and only if $f(a) = f(b)$. Prove that \approx_f is an equivalence relation, and determine the number of equivalence classes under \approx_f .

Problem 2. Suppose that we are playing a game in which we roll three six-sided dice (with sides labeled $1, 2, \dots, 6$). Declare two rolls equivalent if their sums match. Prove that this is indeed an equivalence relation, and determine the number of equivalence classes. Are all of the equivalence classes of the same size?