

- Let $X = \mathbb{N}$, $S = \text{squares}$ and $T = \text{non-squares}$.
- This is a partition, but what is the relation?
- $x \sim y \iff$ both x, y are squares or both x, y are not squares;
- $x \not\sim y \iff$ one is a square and the other is not.
- Now let $f(x) = x + 8$.
- Note: $f(1) = 9$ and $f(4) = 12$, so

$$1 \sim 4 \text{ but } 9 \not\sim 12 \text{ so } f(1) \not\sim f(4).$$