

- Let  $X = \mathbb{Z}$ ,  $\sim = (\text{mod } 5)$ , and  $\mathbb{Z}_5 = \mathbb{Z}/\sim$ .
- Let  $f(x) = x^2$ .
- If  $x \sim y$  then  $(y - x) = 5k$ , but then

$$(y^2 - x^2) = (y - x)(y + x) = 5k(y + x)$$

and thus  $x^2 \sim y^2$ .

- Therefore  $\tilde{f}: \mathbb{Z}_5 \rightarrow \mathbb{Z}_5$  is well-defined.