

Problem of the Month, March 2007:

Let \mathbb{Z}_5 and \mathbb{Z}_7 be the integers mod 5 and mod 7, respectively. Let $[x]_5$ be reduction of the integer x mod 5, and let $[y]_7$ be reduction of the integer y mod 7. Define

$$\mathbb{Z}_5 \boxtimes \mathbb{Z}_7 = \{([x]_5, [y]_7) \in \mathbb{Z}_5 \times \mathbb{Z}_7 \mid \forall n \in \mathbb{Z} \text{ we have } ([nx]_5, [y]_7) = ([x]_5, [ny]_7)\}.$$

Compute the size of the set $\mathbb{Z}_5 \boxtimes \mathbb{Z}_7$.