

$0 = (0, 0)$
 $1 = (1, 1)$
 $2 = (2, 2)$
 $3 = (0, 3)$
 $4 = (1, 0)$
 $5 = (2, 1)$
 $6 = (0, 2)$
 $7 = (1, 3)$
 $8 = (2, 0)$
 $9 = (0, 1)$
 $10 = (1, 2)$
 $11 = (2, 3)$

$$2 + 4 = 6 \rightarrow (0, 2)$$

$\text{mod } 3$ $\text{mod } 4$
 \downarrow \swarrow

$$(2, 2) + (1, 0) = (3, 2) \Rightarrow (3 \text{ mod } 3, 2 \text{ mod } 4)$$

\downarrow
 $(0, 2)$

$$(2, 2) \times (2, 2) = (4, 4)$$

$$(4 \text{ mod } 3, 4 \text{ mod } 4) = (1, 0)$$