

We might be tempted to say

$$(A \times B)^c = A^c \times B^c,$$

but this is not true!!

- Let $E \subseteq \mathbb{Z}$ be the set of even numbers, then $E^c = O$ is the set of odd numbers.
- $E \times E = \{(a, b) : a, b \text{ even}\}$,
- so $(E \times E)^c$ is the set of pairs where not both are even, but this is

$$(E \times E)^c = (E \times O) \cup (O \times E) \cup (O \times O)$$