

# Closure Properties of Regular Languages

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## Sipser Chapter 1, p58-63

Consider a set  $S$  of elements under some operation  $\cdot$ . We say that  $S$  is **closed under**  $\cdot$  if applying  $\cdot$  to the element(s) of  $S$  always results in an element of  $S$ .

For example, the set of natural numbers is closed under addition but not closed under subtraction.

# Closure of the Regular Languages

The class of Regular Languages is closed under

- ▶ complement
- ▶ union
- ▶ intersection
- ▶ set difference
- ▶ symmetric difference
- ▶ concatenation
- ▶ Kleene closure
- ▶ Positive closure
- ▶ reversal
- ▶ etc.