2. Set algebra

Usual algebra	Set algebra
$x \le y$	$X \subseteq Y$, X a *subset* of Y: elements of X are elements of Y
$x + y$	$X \cup Y := \{a \mid a \in X \text{ or } a \in Y\}$, *union*
$x \cdot y$	$X \cap Y := \{a \mid a \in X \text{ and } a \in Y\}$, *intersection*
$x - y$	$X \setminus Y := \{a \mid a \in X \text{ but } a \notin Y\}$, *relative complement*
$-y$	$\sim Y = \neg Y = \overline{Y} := \{a \in U \mid a \notin Y\}$, (*absolute*) *complement*
2^y	$\mathcal{P}(Y) = 2^Y := \{X \mid X \subseteq Y\}$, *power set*

Set Y has *trivial* subset $\emptyset$ and *improper* subset Y.
Write $X \subset Y$ when X is a *proper* subset of Y.

U is the "*universe* (*of discourse*)",
the set of all elements under consideration (e.g., $\mathbb{R}$)

Note $\left|2^Y\right| = 2^{|Y|}$ for finite Y.