13 Design symbols for the 10 two-operand binary operators that are not presented in Section 1.0, and find laws about these operators.

After trying the question, scroll down to the solution.

§ Keeping the 6 two-operand binary operators that are presented in Section 1.0 as they are, I add new ones to match them. (If I were to design all 16 symbols, I would choose those of Unified Algebra.)

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⊤ ⊤	⊤	⊤	⊤	⊤	⊤	⊤	⊤	⊤	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥
⊤ ⊥	⊤	⊤	⊤	⊤	⊥	⊥	⊥	⊥	⊤	⊤	⊤	⊤	⊥	⊥	⊥	⊥
⊥ ⊤	⊤	⊤	⊥	⊥	⊤	⊤	⊥	⊥	⊤	⊤	⊥	⊥	⊤	⊤	⊥	⊥
⊥ ⊥	⊤	⊥	⊤	⊥	⊤	⊥	⊤	⊥	⊤	⊥	⊤	⊥	⊤	⊥	⊤	⊥

For laws, there are so many that I hardly know where to start.

$x \twoheaduparrow y$
$\neg(x \twoheaddownarrow y)$
$\top \mathbin{«} x$
$x \mathbin{»} \top$
$\neg(\bot \mathbin{«} x)$
$\neg(x \mathbin{»} \bot)$
$(x \mathbin{»} y) = (y \mathbin{«} x)$
$(x \mathbin{«} y) = x$
$(x \mathbin{»} y) = y$

and so on.