Laws of set algebra

For any sets A, B, C with universal set $\mathcal{U}$ and empty set $\varnothing$, we have the following laws of set algebra:

Commutativity:

$$A \cup B = B \cup A,$$
$$A \cap B = B \cap A.$$

Associativity:

$$A \cup (B \cup C) = (A \cup B) \cup C,$$
$$A \cap (B \cap C) = (A \cap B) \cap C.$$

Distributivity:

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C),$$
$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C).$$

Absorption:

$$A \cup (A \cap B) = A,$$
$$A \cap (A \cup B) = A.$$

Idempotence:

$$A \cup A = A,$$
$$A \cap A = A.$$

Identity:

$$A \cup \varnothing = A,$$
$$A \cap \mathcal{U} = A.$$

Domination:

$$A \cup \mathcal{U} = \mathcal{U},$$
$$A \cap \varnothing = \varnothing.$$

Complement law:

$$A \cup A^c = \mathcal{U},$$
$$A \cap A^c = \varnothing.$$

Double complement law:

$$(A^c)^c = A.$$

De Morgan's law:

$$(A \cup B)^c = A^c \cap B^c,$$
$$(A \cap B)^c = A^c \cup B^c.$$

We also have the following definitions:

Difference:

$$A - B = A \cap B^c.$$

Symmetric difference:

$$A \ominus B = (A \cup B) - (A \cap B).$$