

## Important Set Identities

A, B and C subset of a universe D.

1.  $\overline{\overline{A}} = A$  Complementation law
2.  $A \cup A = A$  Idempotent 1
3.  $A \cap A = A$  Idempotent 2
4.  $A \cup B = B \cup A$  Commutativity 1
5.  $A \cap B = B \cap A$  Commutativity 2
6.  $A \cup (B \cup C) = (A \cup B) \cup C$  Associativity 1
7.  $A \cap (B \cap C) = (A \cap B) \cap C$  Associativity 2
8.  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$  Distributivity 1
9.  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$  Distributivity 2
10.  $\overline{A \cup B} = \overline{A} \cap \overline{B}$  De Morgan's law 1
11.  $\overline{A \cap B} = \overline{A} \cup \overline{B}$  De Morgan's law 2
12.  $A \cup \emptyset = A$  Identity law 1
13.  $A \cup D = D$  Identity law 2
14.  $A \cap \emptyset = \emptyset$  Identity law 3
15.  $A \cap D = A$  Identity law 4
16.  $\overline{\overline{D}} = \emptyset$  Complement law 1
17.  $\overline{\emptyset} = D$  Complement law 2
18.  $A \cup \overline{A} = D$  Complement law 3
19.  $A \cap \overline{A} = \emptyset$  Complement law 4
20.  $A \cup (A \cap B) = A$  Absorption law 1
21.  $A \cap (A \cup B) = A$  Absorption law 2
22.  $A - B = A \cap \overline{B}$  Difference law