

Worksheet on Boolean Algebra Proofs

Prove each of the following by quoting properties of set operations from the text.

1. For all sets A , B and C with elements from the universe U ,

$$(A \cap C') \cup (B' \cap C) = B \cup C'$$

2. For all sets A , B and C with elements from the universe U ,

$$(A \cap B \cap C) \cup (A \cap B \cap C') \cup (A \cap B' \cap C) \cup (A \cap B' \cap C') = A$$

3. For all sets A , B and C with elements from the universe U , if $A \cup B' = C$, then

$$(A \cap C') \cup (A \cap B')' \cup (A' \cap B)' = C$$

Prove each of the following by quoting properties of a Boolean algebra from the text.

1. For all a and b , $ab + b + (a' + b)' = a + b$.
2. For all a , b and c , $ab' + a(b' + c)' = a(bc)'$.
3. For all a , b and c , if $a + b = b$, then $ab + ac(b + c') = a$.

Now go to

<http://www.ship.edu/~deensl/DiscreteMath/booleanproofsolutions.pdf>

to see one possible solution.