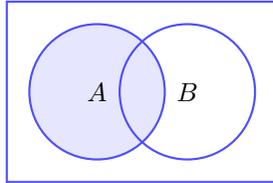
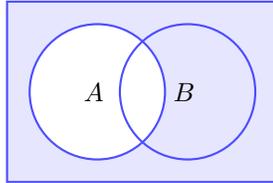


Sixteen things you can say about A and B

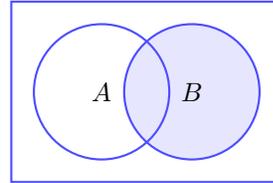
Each of the 16 sets below is indicated by a shaded region.



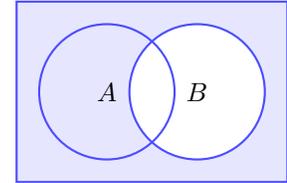
A
 A



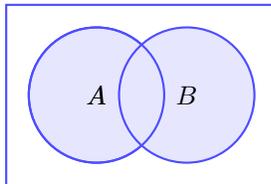
not A
 A^c



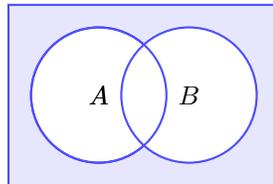
B
 B



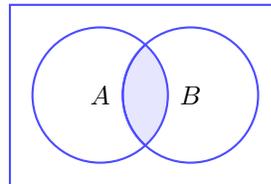
not B
 B^c



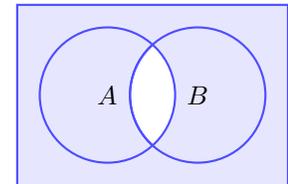
A or B
 $A \cup B$



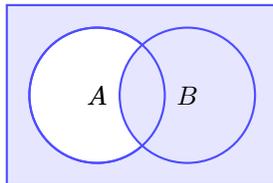
neither A nor B
 $(A \cup B)^c$



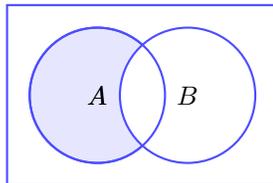
A and B
 $A \cap B$



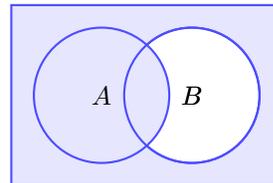
not both A and B
 $(A \cap B)^c$



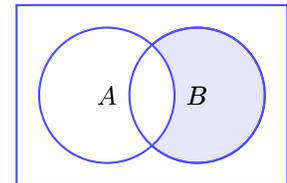
if A then B
 $A^c \cup B$



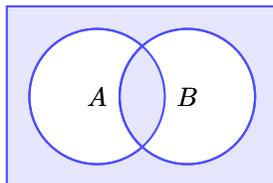
A and not B
 $A \cap B^c$



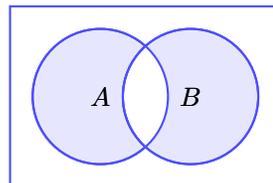
if B then A
 $A \cup B^c$



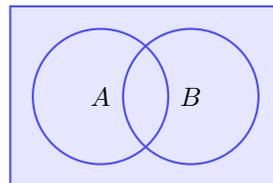
B and not A
 $A^c \cap B$



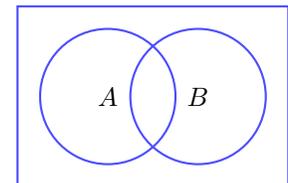
A if and only if B
 $(A \cap B) \cup (A^c \cap B^c)$



A or B but not both
 $(A \cap B^c) \cup (A^c \cap B)$



true
 $A \cup A^c$



false
 $A \cap A^c$

Complementary Laws:
Associative Laws:
Commutative Laws:
Distributive Laws:
De Morgan's Laws:

$A \cup A^c = \emptyset^c$
 $A \cup (B \cup C) = (A \cup B) \cup C$
 $A \cup B = B \cup A$
 $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
 $(A \cup B)^c = A^c \cap B^c$

$A \cap A^c = \emptyset$
 $A \cap (B \cap C) = (A \cap B) \cap C$
 $A \cap B = B \cap A$
 $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
 $(A \cap B)^c = A^c \cup B^c$

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