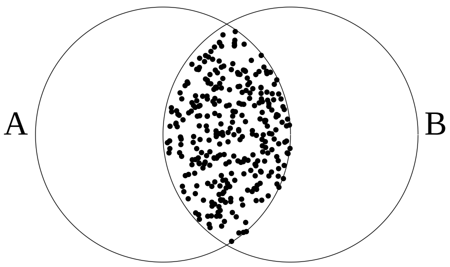
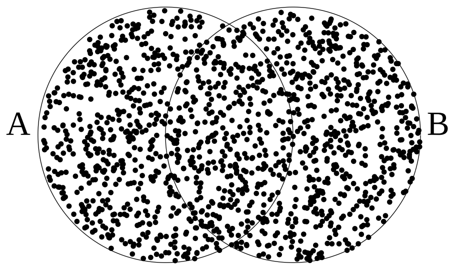
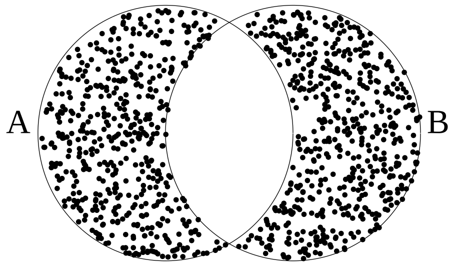
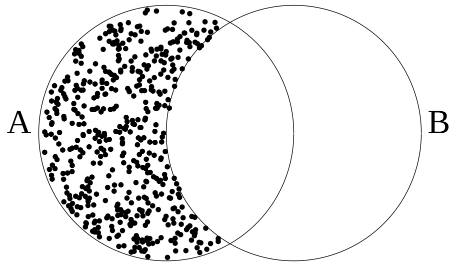
CC111 flashcards p. 1 recto 17.6.2003	$\#(A)$	$A \times B$
$A \subseteq B$	$A \cap B$	$A \cup B$
$A \setminus B$	$A \triangle B$	$\emptyset$
$\mathcal{P}(A)$	R^{-1}, where R is a relation	$\exists x \ldots$
$\forall$	$R \circ S$, where R and S are relations	reflexive relation
symmetric relation	transitive relation	equivalence relation

CC111 flashcards p. 2 recto 17.6.2003	equivalence class	transitive closure
partial order	anti-symmetric relation	total order
a relation which is the graph of a function	injective function	surjective function
bijective function	$f \circ g$, where f and g are functions	$\mathbb{N}$
$\mathbb{Z}$	$\mathbb{Q}$	$\mathbb{R}$
$\#(A) = \#(B)$, where A and B are arbitrary sets	countable	lexicographic ordering

CC111 flashcards p. 3 recto 17.6.2003	First principle of mathematical induction	$x^2 - y^2$
$\#(A \cup B \cup C)$	$\#(A \cup B)$	$n^2 + 2n + 1$
second principle of mathematical induction	$A \cup B$	$A \cap B$
$A \setminus B$	$A \triangle B$	$A \cap (B \cup C)$
$A \cup (B \cap C)$	$\#(A \times B)$	

$\{(x,y) : x \in A,\ y \in B\}$, the set of ordered pairs in which the first element belongs to A and the second element belongs to B	the number of members of A	CC111 flashcards p. 1 verso 17.6.2003
the union of A and B	the intersection of A and B	A is a subset of B
the empty set, the set with no members	$(A \setminus B) \cup (B \setminus A)$	$\{x : x \in A \text{ and } x \notin B\}$
'there is some x such that ...'	$\{(y,x) : (x,y) \in R\}$, the inverse of R	$\{B : B \subseteq A\}$, the set of subsets of A
a relation R on a set A such that $a\,R\,a$ for every $a \in A$	the composition of R and S, the set $\{(x,z) : \exists\, y$ such that $x\,R\,y$ and $y\,S\,z\}$	'for every'
a relation which is reflexive, symmetric and transitive	a relation R such that $a\,R\,c$ whenever $a\,R\,b$ and $b\,R\,c$	a relation R such that $b\,R\,a$ whenever $a\,R\,b$

the smallest transitive relation including a given relation	a set of the form $\{b : a\,R\,b\}$, where R is an equivalence relation on a set A, and $a \in A$	CC111 flashcards p. 2 verso 17.6.2003
a partial order $\leq$ on a set A such that if a, $b \in A$ then either $a \leq b$ or $b \leq a$	a relation R such that if $a\,R\,b$ and $b\,R\,a$ then $a = b$	a relation which is reflexive, transitive and anti-symmetric
a function $f : A \to B$ such that for every $b \in B$ there is an $a \in A$ such that $f(a) = b$	a function f such that if $f(a) = f(b)$ then $a = b$	a relation R such that if $a\,R\,b$ and $a\,R\,c$ then $b = c$
the set $\{0, 1, 2, \ldots\}$ of non-negative integers	the composition of f and g, $(f \circ g)(x) = f(g(x))$	a function which is both surjective and injective
the set of real numbers	the set of rational numbers, numbers expressible as $\frac{p}{q}$ where p and q are integers and $q \neq 0$	the set of all integers, positive and negative
if $a < b < c < \ldots$, then $() < aa < aab < aba < b$ etc.	*either* finite *or* the same size as $\mathbb{N}$	there is a bijection from A to B

$(x+y)(x-y)$	if $P(n_0)$ is true and $P(k+1)$ is true whenever $P(k)$ is true, then $P(n)$ is true for every integer $n \geq n_0$	CC111 flashcards p. 3 verso 17.6.2003
$(n+1)^2$	$\#(A) + \#(B)$ $-\#(A \cap B)$	$\#(A) + \#(B) + \#(C)$ $-\#(A \cap B) - \#(A \cap C)$ $-\#(B \cap C)$ $+\#(A \cap B \cap C)$
		if $P(n)$ is true whenever $P(i)$ is true for every integer i such that $0 \leq i < n$, then $P(n)$ is true for every $n \in \mathbb{N}$.
$(A \cap B) \cup (A \cap C)$		
	$\#(A) \times \#(B)$	$(A \cup B) \cap (A \cup C)$