0. NOTATION

0.0.1 The Greek Alphabet

A, α	alpha	H, η	eta	N, ν	nu	T, τ	tau
B, β	beta	Θ, θ	theta	Ξ, ξ	xi	Y, υ	upsilon
Γ, γ	gamma	I, ι	iota	O, o	omicron	Φ, ϕ, φ	phi
Δ, δ	delta	K, κ	kappa	Π, π	pi	X, χ	chi
E, ϵ	epsilon	Λ, λ	lambda	P, ρ, ϱ	rho	Ψ, ψ	psi
Z, ζ	zeta	M, μ	mu	$\Sigma, \sigma, \varsigma$	sigma	Ω, ω	omega

0.0.2 Set Theory and Functions

$\mathbb{R}$	the set of real numbers;
$\mathbb{C}$	the set of complex numbers;
$\mathbb{Q}$	the set of rational numbers — i.e. the fractions,
$\mathbb{Z}$	the set of integers — i.e. the whole numbers;
$\mathbb{N}$	the set of natural numbers — i.e. the non-negative whole numbers;
$\mathbb{R}^n$	n-dimensional real space — i.e. the set of all real n-tuples $(x_1, x_2, \ldots, x_n)$;
$\mathbb{R}[x]$	the set of polynomials in x with real coefficients;
$\in$	is an element of — e.g. $\sqrt{2} \in \mathbb{R}$ and $\pi \notin \mathbb{Q}$;
$\subset, \subseteq$	is a subset of — e.g. $\mathbb{N} \subseteq \mathbb{Z} \subseteq \mathbb{Q} \subseteq \mathbb{R} \subseteq \mathbb{C}$;
$\lvert X \rvert$	the *cardinality* (size) of the set X;
$X \cup Y$	the *union* of two sets — read 'cup' — $\{s : s \in X \text{ or } s \in Y\}$;
$X \cap Y$	the *intersection* of two sets — read 'cap' — $\{s : s \in X \text{ and } s \in Y\}$;
$X \times Y$	the *Cartesian product* of X and Y — $\{(x, y) : x \in X \text{ and } y \in Y\}$;
$X - Y$ or $X \backslash Y$	the *complement* of Y in X — $\{s : s \in X \text{ and } s \notin Y\}$;
$\varnothing$	the empty set.
$f : X \to Y$	f is a function, map, mapping from a set X to a set Y; X is called the *domain* and Y is called the *codomain;*
$f(X)$ or $f[X]$	the *image* or *range* of the function f — i.e. the set $\{f(x) : x \in X\}$;
$g \circ f$	the *composition* of the maps g and f – do f first then g;
f is *injective* or *1-1*	if $f(x) = f(y)$ then $x = y$;
f is *surjective* or *onto*	for each $y \in Y$ there exists $x \in X$ such that $f(x) = y$;
f is *bijective*	f is *1-1* and *onto*;
f is *invertible*	there exists a function $f^{-1} : Y \to X$ s.t. $f \circ f^{-1} = id_Y$ and $f^{-1} \circ f = id_X$;