Mathematical English Help Sheet

Written form	Reading
$2 + 2 = 4$	2 plus 2 equals 4
$a - b$	A minus B
$a \pm b$	A plus or minus B
$a \times b$	A times B A multiplied by B
$a \div b$	A divided by B
a / b	A over B
½	(a) half
⅔	Two thirds
¾	Three quarters
$\pi/3$	pi over 3 *or* pi by 3
$f(x)$	F of X
x^2	X squared
x^3	X cubed
x^n	X to the (power) N
$(2x + y)^7$	2 X plus Y all to the (power) 7
$x^{1/n}$	X to the (power) one over N
$\sqrt{x}$	The square root of X Root X
$\sqrt[3]{x}$	The cube root of X
e^x	E to the (power) X
e^{-2x+3}	E to the minus 2 X plus 3
$\ln x$	log X *or* the natural log of X
$\log x$	log (to the base 10 of) X
$\lvert x \rvert$	The absolute value of X The modulus of X *or* mod X
$x!$	X factorial
x_n	X (sub) N
$x \to x_0$	X tends to X nought
$x > y$	X is greater than Y
$x \leq y$	X is less than or equal to Y
$1 < x < 2$	X is greater than 1 and less than 2
$x \gg y$	X is much greater than Y
$x \neq y$	X is not equal to Y
$x \approx y$	X is approximately equal to Y
$x \propto y$	X is proportional to Y
$\therefore$	therefore
$\Rightarrow$	implies
$\Leftrightarrow$	if and only if (*or* means the same as)

$\forall$	for all
$\exists$	there exist(s)
$A \subset B$	A is a subset of B
$A \cup B$	The union of A and B A union B
$A \cap B$	The intersect(ion) of A and B A intersect B
$\sin x$	The sine of X *or* sine X /sain/
$\cos x$	The cosine of X *or* cos X /kɒz/
$\tan x$	The tangent of X *or* tan X
$\sin^{-1} x$	The inverse sine of X
$\sin^2 3\theta$	Sine squared 3 theta
x'	X prime(d) *or* X dash(ed)
x''	X double prime(d) X double dash(ed)
$\hat{x}$	X hat
$\tilde{x}$	X tilde
x^*	X star
$\overline{x}$	X bar

Greek Letters *pronunciation*

α	Alpha	
β	Beta	/'bi:tə/
Γ, γ	Gamma	
Δ, δ	Delta	
ε	Epsilon	
ζ	Zeta	/'zi:tə/
η	Eta	/'i:tə/
Θ, θ	Theta	/'θi:tə/
κ	Kappa	
λ	Lambda	
μ	Mu	/mju:/
ν	Nu	/nju:/
ξ	Xi	/sai/ *or* /ksai/
π	Pi	/pai/
ρ	Rho	
Σ, σ	Sigma	
τ	Tau	/taʊ/ *or* /tɔ:/
Φ, ϕ	Phi	/fai/
χ	Chi	/kai/
Ψ, ψ	Psi	/sai/ *or* /psai/
Ω, ω	Omega	/'əʊmigə/

Names of Other Symbols

( )	(round) brackets
[ ]	Square brackets
{ }	Curly brackets
∇	Nabla
$\rightarrow$	(right) arrow

Written form	Reading
$\lim_{x\to\infty} f(x)$	The limit of F of X as X tends to infinity
$\frac{dy}{dx}$	The derivative of Y with respect to X D Y by D X
$\frac{d^2y}{dx^2}$	The second derivative of Y with respect to X D 2 Y by D X squared
$\frac{\partial y}{\partial x}$	The partial derivative of Y with respect to X Partial D Y by D X
$\int y\,dx$	The integral of Y with respect to X
$\int_a^b y\,dx$	The integral of Y with respect to X between (X equals) A and (X equals) B *OR* The integral of Y with respect to X from (X equals) A to (X equals) B
$\forall\varepsilon>0,\exists\delta>0,\forall x: 0<\lvert x-x_0\rvert<\delta, \lvert f(x)\rvert<\varepsilon$	For all positive ε, there exists positive δ such that, for all X satisfying $0<\lvert x-x_0\rvert<\delta$, the absolute value of F of X is less than ε.

Practice

How would you read the following?

1) $3x^2 + 2xy - y^5 + 5/13 = (x - 1)^3$

2) $y = \pm\sqrt{e^x + \sin x}$

3) $0 < |x - 1| \le \pi/2$

4) $\lim_{x\to-\infty} f(x) = \log_2 7$

5) $a_n = x! / n!$

6) $\frac{dx}{dt} = t^{-1/3} + \cos 4t$

7) $\int_2^\infty f(x)\,dx$