NOTATION · CHEAT SHEET

Polynomials, Equations and Inequalities: Notation at a Glance

The marks from the notation cards across the polynomial, equation and inequality pages: how each is read and what it means. Every group links to the full card on its page.

POLYNOMIAL ROOTS

$a_n x^n + \cdots + a_0$

A-N X TO THE N, DOWN TO A-ZERO
Standard form; the subscript of each coefficient is its power of x.

$\deg P = n$

THE DEGREE OF P IS N
The highest power with a nonzero coefficient.

$(x - r)^m$

X MINUS R, TO THE MULTIPLICITY M
The root r counted m times.

POLYNOMIAL RULES

$P = (x - c)\,Q + R$

QUOTIENT AND REMAINDER
Division as a product: quotient $Q(x)$, remainder $R = P(c)$.

$P(c),\ P(-x)$

P OF C; P OF MINUS X
Put in, not multiply: a value, and a new polynomial.

$\pm\frac{p}{q}$

PLUS OR MINUS P OVER Q
Rational root candidates: $p \mid a_0$, $q \mid a_n$.

$r_1, \ldots, r_n$

R SUB ONE TO R SUB N
The roots, listed once per multiplicity.

QUADRATIC EQUATIONS

$ax^2 + bx + c = 0$

STANDARD FORM
Descending powers, everything on the left, $a \neq 0$.

$\Delta = b^2 - 4ac$

DELTA, THE DISCRIMINANT
Its sign tells how many real roots there are.

$x_1,\ x_2$

X ONE AND X TWO
The two roots; the subscripts only count.

ABSOLUTE VALUE EQUATIONS

$|x|$

THE ABSOLUTE VALUE OF X
Distance of x from 0; never negative.

$|a + b|$

ABSOLUTE VALUE OF A PLUS B
The bars cover the whole quantity: add first, then take the size.

$|x| = \sqrt{x^2}$

THE ROOT OF THE SQUARE
A second definition, handy with radicals.

INEQUALITIES

(a, b)

OPEN INTERVAL FROM A TO B
Endpoints left out.

$[a, b]$

CLOSED INTERVAL FROM A TO B
Endpoints included.

$(a, \infty) \cdot (-\infty, a]$

RAYS
Infinity always takes a round bracket.

$\cup$

UNION
Joins two intervals into one solution set.

LINEAR INEQUALITIES

$< \cdot \leq \cdot > \cdot \geq$

LESS THAN … GREATER THAN OR EQUAL TO
The bar under the sign adds equality.

$-3 < 2x + 1 \leq 7$

A COMPOUND INEQUALITY
Both conditions at once: an "and".

$(-\infty, 9]$

FROM MINUS INFINITY TO NINE, INCLUSIVE
The solution written as an interval.

SAME MARKS, DIFFERENT JOB

$\lvert x\rvert,\ \lvert z\rvert,\ \lvert A\rvert$	Absolute value of a number, modulus of a complex number, determinant of a matrix: the same two bars.
(a, b)	An open interval here; a point in the plane in coordinate geometry.
p in $\frac{p}{q}$	Any divisor of a_0, not necessarily a prime.