# MathType and MathSpeak Combined Reference

The following lists combine the lists from both the MathType and MathSpeak orientations for easy reference.

## Math Operator Symbols

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | + | plus |
|  | - | minus |
|  | \times | times |
|  | \cdot | dot |
|  | \div | Division-sign |
|  | \pm | plus-or-minus |

## Equality symbols

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | = | equals |
|  | \neq or \ne | not-equals |
|  | \approx | almost-equals |
|  | < | less-than |
|  | \leq or \le | less-than-or-equal-to |
|  | > | greater-than |
|  | \geq or \ge | greater-than-or-equal-to |
|  | \equiv | Is defined as the quantity |

## Set symbols

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \cap | Intersection |
|  | \cup | Union |
|  | \land | Logical-and |
|  | \lor | Logical-or |
|  | \in | Element-of |
|  | \not\in | Not-element-of |
|  | \ni or \owns | contains-as-member |
|  | \subset | Subset-of |

## Grouping Symbols

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | ( | left-p’ren |
|  | ) | right-p’ren |
|  | \left[ or \lbrack | left-brack |
|  | \right] or \rbrack | right-brack |
|  | \lbrace | left-brace |
|  | \rbrace | right-brace |
|  | \langle | l-angle-brack |
|  | \rangle | r-angle-brack |
|  | \left[\!\left[ | l-bar-brack |
|  | \right]\!\right] | r-bar-brack |
|  | \left| | StartAbsoluteValue |
|  | \right| | EndAbsoluteValue |
| | | |  \*Looks the same as absolute value lines but comes alone; use the pipe character above the enter key. | vertical-line  \*Looks the same as absolute value lines but comes alone |
|  | \left \lceil \right \rceil | left-ceiling … right-ceiling |

## Fractions

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \frac{a}{b} | StartFrac a Over b EndFrac |
|  | \frac{a}{\frac{b}{c}} | StartStartFrac a OverOver StartFrac b Over c EndFrac EndEndFrac |
|  | a \frac{b}{c} | a StartFrac b Over c EndFrac |

## Subscripts and Superscripts

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | a^2 | a squared |
|  | a^3 | a cubed |
|  | a^4 | a Sup 4 Base |
|  | a\_1 | a Sub 1 Base |
|  | a^{12} | a Sup 12 Base |
|  | a\_{12} | a Sub 12 Base |
|  | a\_{12}^{24} \*subscript first | a Sub 12 Sup 24 Base \*subscript first |

## Roots

| ***Source*** | ***MathSpeak*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \sqrt{a} | StartRoot a EndRoot |
|  | \sqrt{a\sqrt{b}} | NestStartRoot a StartRoot b EndRoot NestEndRoot |
|  | \sqrt[a]{b} | RootIndex a StartRoot b EndRoot |

## Character Modifiers

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \bar{a} | a overBar |
|  | \bar{(\bar{a})} | ModAbove left-p’ren a overBar right-p’ren with bar |
|  | \vec{a} | ModAbove a with right-arrow |
|  | \hat{a} | ModAbove a with caret |
|  | \ddot{a} | ModAbove a with two-dots |
|  | a’ or a \prime | a prime |

## Summations

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \sum\_{a}^{b} c | sigma-summation Underscript a Overscript b EndScripts c |

## Limits

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \lim\_{a} b | limit Underscript a EndScripts b squared |

## Integrals

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \int\_{a}^{b} c | Integral Sub a Sup b Base c |
|  | \iint \limits\_{a} b | double integral Underscript a EndScripts b |

## Functions

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \log | log |
|  | \cos | cosine |
|  | \sin | sine |
| tan | \tan | tan |

## Greek Letters

|  |  |  |
| --- | --- | --- |
| ***Source*** | ***Tex*** | ***MathSpeak*** |
|  | \Sigma | Upper Sigma |
|  | \pi | pi |
|  | \theta | theta |
|  | \Delta | Upper Delta |
|  | \delta | delta |
|  | \alpha | alpha |
|  | \lambda | lambda |
|  | \mu | mu |
|  | \gamma | gamma |
|  | \rho | rho |
|  | \varepsilon | epsilon |
|  | \nabla | nabla |
|  | \chi | chi  \*watch for subtle difference between an “x” and a “chi” |

## Miscellaneous symbols

| ***Source*** | ***TeX*** | ***MathSpeak*** |
| --- | --- | --- |
|  | \o or \emptyset or \varnothing | null |
|  | \circ | degree |
|  | \angle | angle |
|  | \measuredangle | measured angle |
|  | \R | Real |
|  | \& | Ampersand |
|  | \% | percent |
|  | \partial | partial |
|  | \infty | infinity |
| : | : | colon |
|  | , | comma |
|  | \dots | ellipsis |
| ? | ? | question-mark |
|  | \rightarrow | right-arrow |
| ~ | ~ | tilde |
|  | \forall | For-all |
| | | | | v-line |
|  | \exists | There-exists |
|  | \oint | integral sign with superposed circle |
|  | \oplus | exclusive or |
|  | \lnot | not |
| / | / | slash |