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PROGRAM APPLICATION INSTRUCTION   Section 3 (I)
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EQN (I)   **EQN (I)**

NAME

eqn — typeset mathematics

SYNOPSIS

eqn [file] ...

DESCRIPTION

Eqn is a *troff*(I) preprocessor for typesetting mathematics on the Graphics Systems, Inc. photo-typesetter. Usage is almost always (e.g. for this page):

eqn file ... | troff

If no files are specified, *eqn* reads from the standard input. A line beginning with ".EQ" marks the start of an equation; the end of an equation is marked by a line beginning with ".EN". Neither of these lines is altered or defined by *eqn*, so you can define them yourself in *troff*(I) to get centering, numbering, etc. All other lines are treated as comments, and passed through untouched.

Spaces, tabs, new-lines, braces, double quotes, tilde, and circumflex are the only delimiters. Braces "{}" are used for grouping. Use tildes "~" to get extra spaces in an equation.

Subscripts and superscripts are produced with the keywords **sub** and **sup**: Thus *x sub i* makes x_i, *a sub i sup 2* produces a_i^2, and *e sup {x sup 2 + y sup 2}* gives $e^{x^2+y^2}$. Fractions are made with **over**: *a over b* is $\frac{a}{b}$ and *1 over sqrt {ax sup 2 + bx + c}* is $\dfrac{1}{\sqrt{ax^2+bx+c}}$; **sqrt** makes squareroots:

The keywords **from** and **to** introduce lower and upper limits on arbitrary things (like lim, sum or int): $\lim\limits_{n\to\infty}\sum\limits_{0}^{n}x_i$ is made with *lim from {n-> inf} sum from 0 to n x sub i*. Left and right brackets, braces, etc., of the right height are made with **left** and **right**: *left [x sup 2 + y sup 2 over alpha right] ~ =~ 1* produces $\left[x^2+\dfrac{y^2}{\alpha}\right] = 1$. The **right** clause is optional.

Vertical piles of things are made with **pile, lpile, cpile,** and **rpile**: *pile {a above b above c}* produces $\begin{matrix}a\\b\\c\end{matrix}$. There can be an arbitrary number of elements in a pile. **lpile** left-justifies, **pile** and **cpile** center, with different vertical spacing, and **rpile** right justifies.

Diacritical marks are made with **dot, dotdot, hat, bar**: *x hat = f(t) bar* is $\hat{x}=\overline{f(t)}$. Default sizes and fonts can be changed with **size n** and **roman, italic,** and **bold,** respectively.

The following keywords and shorthand notations are recognized and translated appropriately: sum, int, inf, >=, -, ->, !=, : *sum* ($\sum$), *int* ($\int$), *inf* (∞), and shorthands like >= ($\geq$), -> ($\rightarrow$), != ($\neq$) are recognized. Spell out Greek letters in the desired case, as in *alpha, GAMMA*. Mathematical words like *sin, cos, log* are made Roman automatically. *Troff*(I) four-character escapes like \(ua ($\uparrow$ — for "up arrow") can be used anywhere. Strings enclosed in double quotes "..." are passed through untouched.

FILES

man/man1/eqn.1 for the raw text of this file
/usr/lib/tmac.a for macros used to produce this page
man/manmac for macros used to produce this page

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SEE ALSO

Typesetting Mathematics — *User's Guide (2nd Edition)* by B. W. Kernighan and L. L. Cherry

New Graphic Symbols for EQN and NEQN by C. Scrocca

NROFF/TROFF User's Manual by J. F. Ossanna

troff(I), neqn(I)

BUGS

Undoubtedly. Watch out for small or large point sizes — it's tuned too well for size 10. Be cautious if inserting horizontal or vertical motions, and of backslashes in general.