Notation Summary

CSE 4303 / CSE 5365 Computer Graphics

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Notation

A consistent notation helps to make explanations clear.

Item	Notation	Examples
angle	lowercase Greek	$\alpha, \beta_i, \gamma, \rho_0, \phi_{23}, \theta$
scalar	lowercase italic	$a, b, c_i, u_{ij}, m_{0,1}$
vector *or* point	lowercase bold	$\mathbf{u}, \mathbf{v}_i, \mathbf{w}_x$
matrix	capital bold	$\mathbf{A}, \mathbf{B}, \mathbf{M}$

Note that *points* and *vectors*, though written the same way, are *different* kinds of objects. The reason for distinguishing points from vectors will become clearer once we go deeper into their uses in CGI (Computer Generated Imagery).

Occasionally, we will emphasize that a particular object is a vector by placing an arrow on top, as $\vec{\mathbf{v}}$.

Occasionally, we will emphasize that a particular object is a matrix by enclosing it in brackets, as $[\mathbf{M}]$.

Bracketing Characters

The bracketing characters come in pairs and have specific names.

Notation	Name
$($ $)$	Parentheses
$\{$ $\}$	Braces
$[$ $]$	(Square) Brackets
$\langle$ $\rangle$	Angle Brackets

Symbols

Notation	Name	Example
$\therefore$	*... therefore ...*	All humans are mortal. Socrates is a human. $\therefore$ Socrates is mortal.
$\because$	*... because ...*	11 is prime $\because$ it has no positive integer factors other than itself and one.
$\rightarrow$, $\Longrightarrow$	*... implies ...*	$x = 6 \rightarrow x^2 = 36$
$\nrightarrow$	*... does **not** imply ...*	$x^2 = 36 \nrightarrow x = 6 \because x \text{ could} = -6$
$\leftrightarrow$, $\Longleftrightarrow$	*... if and only if ...*	$\mathbf{u} \cdot \mathbf{v} = 0 \leftrightarrow \mathbf{u} \perp \mathbf{v}$
$\perp$	*... is perpendicular to ...*	$\mathbf{u} \perp \mathbf{v} \leftrightarrow \mathbf{u} \cdot \mathbf{v} = 0$
$\parallel$	*... is parallel to ...*	$\mathbf{u} \parallel \mathbf{v} \leftrightarrow \|\mathbf{u} + \mathbf{v}\| = \|\mathbf{u}\| + \|\mathbf{v}\|$
$\equiv$	*... is defined to be ...*	$x^2 \equiv x \cdot x$
$\blacksquare$	*... QED*	

A longer list may be found at Wikipedia's list of mathematical symbols (whence some of the examples above were derived).

> http://en.wikipedia.org/wiki/List_of_mathematical_symbols