Adding math to Latex

2020-12-16

1 writing modes for mathematical expressions:

- **the inline mode**: be used to write formulas that are part of a text.
- **the display mode**: be used to write expressions that are put on separate lines.

1.1 The inline mode

In physics, the mass-energy equivalence is stated by the equation $E = mc^2$,discovered in 1905 by Albert Einstein.

1.2 The displayed mode

The displayed mode has two versions: numbered and unnumbered.

The mass-energy equivalence is described by the famous equation

$$E = mc^2$$

discovered in 1905 by Albert Einstein. In natural units ($c = 1$),the formula express the identity

$$E = m \tag{1}$$

$$E = mc * c \tag{2}$$

2 Other math mode commands

(1) Subscripts in math mode are written as a_b.

(2) Superscripts are written as a^b.

(3) Combined subscripts and superscripts

$$T^{i_1 i_2 \ldots i_p}_{j_1 j_2 \ldots j_q} = T(X^{i_1}, \ldots, x^{i_p}, e_{j_1}, \ldots, e_{j_q})$$

(4) Integrals

using $\int$

(5) fractions

using $\frac{a}{b}$

(6) limits

$$\int_0^1 \frac{dx}{e^x} = \frac{e-1}{e}$$

(7) geek letters

ω δ Ω Δ

(8) mathematical operators

$\sin(\beta)$ $\cos(\alpha)$ $\log(x)$

3 Matrices

(1) plain

$$1 \quad 2 \quad 3$$
$$a \quad b \quad c$$

(2) Parentheses; round brackets

$$\begin{pmatrix} 1 & 2 & 3 \\ a & b & c \end{pmatrix}$$

(3) brackets;square brackets

$$\begin{bmatrix} 1 & 2 & 3 \\ a & b & c \end{bmatrix}$$

(4) braces $\begin{bmatrix} a & b & c \\ 1 & 2 & 3 \end{bmatrix}$

(5)pipes

$$\begin{vmatrix} a & b & c \\ 1 & 2 & 3 \end{vmatrix}$$

(6) double pipes

$$\begin{Vmatrix} a & b & c \\ 1 & 2 & 3 \end{Vmatrix}$$