

1. TYPESETTING MATHEMATICAL FORMULAS

(1) Typeset

$$\delta(x) = \int_1^{15} \cos x \frac{x \sin x + 4}{x^2 - 90} dx$$

(2) Typeset

$$\Gamma(x) = \sum_{j=0}^{\infty} \binom{j}{2} x^j \tag{1}$$

(3) Typeset $x \in \mathbb{R}, y \in \mathbb{C}$.

(4) Typeset

$$f(x) = x^n e^{-x^2 \sin x}$$

$$g(x) = x^{2n} + f\left(\frac{\sqrt{x}}{\cos x}\right)$$

(5) Typeset (matrix with `\[` or `\bmatrix` if `amsmath` is used)

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

(6) Typeset

$$f(x) = \begin{cases} \int_1^{30} e^{-xt} \sinh(t) dt & \text{if } x > 0, \\ \int_{-30}^0 e^{-xt} \cosh(t) dt & \text{if } x \leq 0. \end{cases}$$

(7) Typeset (note the position of the equation number)

$$k_n = \sum_{\substack{k \in \mathbb{Z} \\ k \neq 0}} k^{-n} (k + n!)$$

$$\ell_n = \sum_{\substack{k \in \mathbb{N} \\ k > 20}} k^{-n} (k + n!) \tag{2}$$

(8) Typeset: Define the set $A_n = \{1, \dots, n\}$ and the matrix

$$B = \begin{pmatrix} a_{1,1} & \dots & a_{1,n} \\ a_{2,1} & \dots & a_{2,n} \\ \vdots & \ddots & \vdots \\ a_{n,1} & \dots & a_{n,n} \end{pmatrix}$$

(9) Typeset

$$C = \bigcup_{j \geq 1}^{\circ} A_j$$