A simple LaTeX document

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Example 1: The following paragraph (given in quotes) is an example of Center Alignment using the center environment. [**Labov1972**]

"LaTeX is a document preparation system and document markup language. LaTeX uses the TeX typesetting program for formatting its output, and is itself written in the TeX macro language. LaTeX is not the name of a particular editing program, but refers to the encoding or tagging conventions that are used in LaTeX documents".

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1. First level item

2. First level item

    (a) Second level item

    (b) Second level item

        i. Third level item

        ii. Third level item

            A. Fourth level item

            B. Fourth level item

$$a_{n_i} a_{n_i}$$

$$\int_{i=1}^{n} \int_{i=1}^{n}$$

$$\sum_{i=1}^{\infty} \sum_{i=1}^{\infty}$$

$$\prod_{i=1}^{n} \prod_{i=1}^{n}$$

$$\bigcup_{i=1}^{n} \bigcup_{i=1}^{n}$$

$$\bigcap_{i=1}^{n} \bigcap_{i=1}^{n}$$

$$\oint_{i=1}^{n} \oint_{i=1}^{n}$$

$$\coprod_{i=1}^{n}$$

Table 1 – Multi-column table

Multi-column	
X	X

Table 2 – Multi-row table

Multirow	X
	X

Table 3 – Multi-column and multi-row table

Multi-col-row		X
		X
X	X	X

$x = \frac{1+y}{1+2z^2}$

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2

$$\int_0^\infty e^{-x^2}\,dx = \frac{\sqrt{\pi}}{2}$$

$$\iint\limits_{\mathbf{x}\in\mathbf{R}^2} \langle \mathbf{x}, \mathbf{y}\rangle\,d\mathbf{x}$$

$\iint f(x,y)\,\mathrm{d}x\mathrm{d}y$

$$x = y + 3 \tag{1}$$

In equation (2) we saw ...

$]0,1[\,+\, \lceil x \rceil - \langle x, y\rangle$

$$\binom{n+1}{k} = \binom{n}{k} + \binom{n}{k-1}$$

$$|x| = \begin{cases} -x & \text{if } x < 0 \\ x & \text{otherwise} \end{cases}$$

$$\underbrace{n(n-1)(n-2)\ldots(n-m+1)}_{\text{total of } m \text{ factors}}$$

$$\int 1 = x + C$$
$$\int x = \frac{x^2}{2} + C$$
$$\int x^2 = \frac{x^3}{3} + C \tag{2}$$

eqnarray and eqnarray* Similar to align and align* Not recommended because spacing is inconsistent

$$F(x,y) = 0 \ \text{ and } \ \begin{vmatrix} F''_{xx} & F''_{xy} & F'_x \\ F''_{yx} & F''_{yy} & F'_y \\ F'_x & F'_y & 0 \end{vmatrix} = 0$$

3

$$\sin A \cos B = \frac{1}{2} \left[\sin(A - B) + \sin(A + B) \right]$$

$$\sin A \sin B = \frac{1}{2} \left[\sin(A - B) - \cos(A + B) \right]$$

$$\cos A \cos B = \frac{1}{2} \left[\cos(A - B) + \cos(A + B) \right]$$

$$\frac{d}{dx} \left(\int_0^x f(u) \, du \right) = f(x).$$

$$a = b + c \tag{3}$$

some intervening text

$$a = b + c \tag{4a}$$
$$d = e + f + g \tag{4b}$$
$$h = i + j \tag{4c}$$

$$\boxed{\eta \le C(\delta(\eta) + \Lambda_M(0, \delta))}$$

$$\Re z = \frac{n\pi \dfrac{\theta + \psi}{2}}{\left(\dfrac{\theta + \psi}{2} \right)^2 + \left(\dfrac{1}{2} \log \left| \dfrac{B}{A} \right| \right)^2}. \tag{5}$$

$$\frac{\sum_{n>0} z^n}{\prod_{1 \le k \le n} (1 - q^k)} \tag{6}$$

$$\sum_{\substack{0 \le i \le m \\ 0 < j < n}} P(i, j) \tag{7}$$

$$\lim_{x \to 0} \frac{e^x - 1}{2x} \overset{\left[\substack{0 \\ 0}\right]}{\underset{\mathrm{H}}{=}} \lim_{x \to 0} \frac{e^x}{2} = \frac{1}{2}$$

$$a \xrightarrow[under]{over} bA \xLeftarrow[under]{over} BB \xRightarrow[under]{over} CC \xLeftrightarrow[under]{over} DD \xleftarrow[under]{over} EE \xhookrightarrow[under]{over} FF \xmapsto[under]{over} G$$

If

$$A = \sigma_1 + \sigma_2$$
$$B = \rho_1 + \rho_2$$

then

$$C(x) = e^{Ax^2+\pi} + B$$

3-simplex