The congruence symbol $\cong$ does not require an extra package, but not-congruence symbol $\ncong$ would require the package 'amssymb'.

It is not so hard to create a matrix:

$$\begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

For every vector $x \in \mathbb{R}^3$, we define the norm of x by $\|x\|^2 = \langle x, x \rangle$, i.e.

$$\|x\| = \sqrt{\langle x, x \rangle}.$$

Normal parentheses would not adjust their size to fit the expression, but we have a solution for that, too:

$$(\sum_{n=1}^{\infty} \frac{1}{n^s})^2 \text{ versus } \left(\sum_{n=1}^{\infty} \frac{1}{n^s} \right)^2$$

Also,

$$A = \{\frac{m}{n} : m, n \in \mathbb{R}\} \text{ versus } A = \left\{ \frac{m}{n} : m, n \in \mathbb{R} \right\}$$

We can also define a function implicitly by

$$f(x) = \begin{cases} x - 1 & \text{if } x < 0 \\ x^2 & \text{if } 0 \leq x < 1 \\ \sin x & \text{otherwise} \end{cases}$$

We can also do the following:

$$\begin{aligned} (x+y)^3 &= (x+y)(x+y)(x+y) && (1) \\ &= (x^2 + 2xy + y^2)(x+y) && (2) \\ &= x^3 + 3x^2y + 3xy^2 + y^3 && (3) \end{aligned}$$

We could also do without the numberings:

$$\begin{aligned} (x+y)^3 &= (x+y)(x+y)(x+y) \\ &\leq (x^2 + 2xy + y^2)(x+y) \\ &< x^3 + 3x^2y + 3xy^2 + y^3 + 1 \end{aligned}$$