

## Math with amsmath

The `amsmath` package provides much more advanced math capability compared to basic  $\text{\LaTeX}$ . While it provides many environments in which to display math, I am only showing a small number of them in this document.

The most versatile environment for displaying math is `align`. It allows multiple lines of math (numbering each line), with an alignment point for (optional) multiple columns.

The basic environment, without an equation number (by using the ‘starred’ version of the environment, `align*`). Without alignment, the equation is centred, the same as using `\[...\]`:

$$a + b = c + d$$

Use the familiar `\\` to start a new line, and an ampersand (`&`) for alignment:<sup>1</sup>

$$a + b = c + d \tag{1}$$

$$e = f + g + h \tag{2}$$

With multiple columns:

$$a = b + c \qquad j = k + l + m \qquad u + v = w \tag{3}$$

$$d + e = f \qquad n + o + p = q \qquad x = y + z \tag{4}$$

The `amsmath` package defines the `split` environment to break a single equation over multiple lines. See now how easy it is to align the three lines when the alignment point lies *after* the equals sign:

$$x = y + z \tag{5}$$

$$a = b + c \tag{6}$$

$$+ d + e$$

I find these two environments sufficient for almost everything. Look at one of the various math guides for other environments the `amsmath` package provides if `align` and `split` do not serve your purposes.

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<sup>1</sup>I align my equations *after* the equals sign, for reasons that become clear later; for correct spacing, empty curly braces must be inserted before the ampersand.