WPG

Practical LaTeX Tutorial # 22

Objectives

- Aligned Formulas
- Aligned Environment
- Simple Alignment
- Annotated Alignment
- Annotated Alignment Integration Example

Simple Alignment

Align environment with each equation numbered.

$$x_1 - 2x_2 - x_3 + 3x_4 = 0 \tag{1}$$
$$-2x_1 + 4x_2 + 5x_3 - 5x_4 = 3 \tag{2}$$
$$3x_1 - 6x_2 - 6x_3 + 8x_4 = 2 \tag{3}$$

Align environment to hide equation numbers with the $\backslash notag$ command.

$$\begin{aligned} x_1 - 2x_2 - x_3 + 3x_4 &= 0 \qquad (4)\\ -2x_1 + 4x_2 + 5x_3 - 5x_4 &= 3\\ 3x_1 - 6x_2 - 6x_3 + 8x_4 &= 2 \end{aligned}$$

Hidding all the equation numbers by *align** environment.

$$\begin{aligned} x_1 - 2x_2 - x_3 + 3x_4 &= 0\\ -2x_1 + 4x_2 + 5x_3 - 5x_4 &= 3\\ 3x_1 - 6x_2 - 6x_3 + 8x_4 &= 2 \end{aligned}$$

Annotated Alignment

$$\begin{aligned} \lim_{x\to c}(x^3 + 4x^2 - 3) &= \lim_{x\to c} x^3 + \lim_{x\to c} 4x^2 - \lim_{x\to c} 3 && \text{Sum and Difference Rules}\\ &= c^3 + 4c^2 - 2 && \text{Power and Multiple Rules} \end{aligned}$$

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Annotated Alignment | Integration Exmaple

$$\int_0^{\pi/4} \frac{\mathrm{d}x}{1-\sin x} = \int_0^{\pi/4} \frac{1}{1-\sin x} \cdot \frac{1+\sin x}{1+sinx}\,\mathrm{d}x$$ Multiply and divide by conjugate.

$$= \int_0^{\pi/4} \frac{1+\sin x}{1-\sin^2 x}\,\mathrm{d}x$$ Simplify.

$$= \int_0^{\pi/4} \frac{1+\sin x}{\cos^2 x}\,\mathrm{d}x$$ $1-\sin^2 x = \cos^2 x$

$$= \int_0^{\pi/4} (\sec^2 x + \sec^2 x \tan x)\,\mathrm{d}x$$ Use Table 8.1, Formulas 8 and 10

$$= [\tan x + \sec x]_0^{\pi/4}$$

$$= (1+\sqrt{2}-(0+1))$$

$$= \sqrt{2}.$$