TeX Tricks

Math 347

February 28, 2022

1   The align(*) environment

Introductory text

$$a^2 + b^2 = c^2$$

Here's a chain of inequalities

$$
\begin{aligned}
c^2 &= a^2 + b^2 \\
&\leqslant a^2 + b^2 + x^2 + y^2
\end{aligned}
$$

Some numbered equations

$$
\begin{aligned}
c^2 &= a^2 + b^2 \\
&\leqslant a^2 + b^2 + x^2 + y^2 \tag{1} \\
&\leqslant (a+1)^2 + b^2 + x^2 + y^2 \tag{2}
\end{aligned}
$$

To refer to an equation, make sure to label it, then reference it using using the "ref" or "eqref" command: I am referencing equation 1 and also equation (2).

Multiple columns is nice too

$$
\begin{aligned}
c^2 &= a^2 + b^2 & \qquad z^2 &= x^2 + y^2 \\
n &= (r, s) & C &= \max(|t|, |\ell|)
\end{aligned}
$$

Lemma 1.1. *This is not a lemming*

By Fermat's Last Theorem, lemma 1.1 holds.

2   Delimiters

Standard parenthesis sizes are (). We change their size by (). Also $\left(\right)$, $\left(\right)$, and $\left(\right)$. Finally, the command () will automatically size parentheses. So

$$
\begin{aligned}
(a + b) &= c \\
\left(a^2 + b^2\right) &= c^2 \\
\left(\frac{a}{b}\right) &= c
\end{aligned}
$$

You can do the same with [] and {}:

$$\left[\frac{a}{b}\right]$$
$$\left\{\frac{a}{b}\right\}$$

3 Miscellaneous

Here is a piecewise function

$$f(x) = \begin{cases} 0 & \text{if } x \text{ is irrational} \\ 1 & \text{if } x \text{ is rational} \end{cases}$$

Some other symbols:
Here is the statement of induction:

$$\varphi(0) \& (\forall n : \varphi(n) \to \varphi(n+1)) \to \forall n : \varphi(n)$$