

Chapter 1

Math!

1.1 The basics

This is math mode: $x = 2$. This is also math mode $x = 3$. Display mode is
blow

$$x = 2$$

or

$$x = 3$$

Fraction: $\frac{1}{2}$.

Super and subscripts: $e_{\text{subscript}}^{\text{superscript}}$

1.2 Different environments

$$\begin{aligned} A &= 2 \\ &= 3x \end{aligned} \tag{1.1}$$

For longer equations

$$\begin{aligned} p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3 \\ - 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3 \end{aligned}$$

To align equations

$$\begin{array}{l} 2x-5y=8 \\ 3x+9y=-12 \end{array}$$

If you just want a few centered equations

$$\begin{array}{c} 2x-5y=8 \\ 3x^2+9y=3a+c \end{array}$$

1.3 keywords

All trig functions

max, min, ker, exp, deg, gcd, lg, ln, Pr, sup, det, hom, lim, log, arg

This is now OOGLABOOGLA₂ = 2

$$a\ BOB\ b=3$$

$$a\ ISSMALLERTHAN\ b$$

1.4 large operators

$$\int_1^n$$

$$|_0^1$$

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

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

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

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

$$\int_1^n$$

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

1.5 matrices

inline matrix $\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}$
plain matrix

$$\begin{smallmatrix} a & b & c \\ d & e & f \end{smallmatrix}$$

round matrix

$$\left(\begin{smallmatrix} a & b & c \\ d & e & f \end{smallmatrix}\right)$$

square matrix (most common)

$$\left[\begin{smallmatrix} a & b & c \\ d & e & f \end{smallmatrix}\right]$$

curly matrix

$$\left\{\begin{smallmatrix} a & b & c \\ d & e & f \end{smallmatrix}\right\}$$

piped matrix

$$\left|\begin{smallmatrix} a & b & c \\ d & e & f \end{smallmatrix}\right|$$

double piped matrix

$$\left\|\begin{smallmatrix} a & b & c \\ d & e & f \end{smallmatrix}\right\|$$

piecewise expression

$$\begin{cases} x^2 + 2 & x = 3 \\ 3 & x \neq 3 \end{cases}$$

1.6 Equivalence relations

$$x \not\leq 2$$

$$x \stackrel{a}{=} z$$

1.7 Brackets and stuff

$$(a)[a]\{a\}\langle a\rangle|a| ||a||$$

Manual sizing

$$(((($$

For dynamic sizing

$$\left(\int_a^b\right)$$

Asymmetrical dynamically sized bracket

$$\left(\int_a^b\right.$$

1.8 spacing

$$\begin{aligned} f(x) &= x^2 + 3x + 2 \\ f(x) &= x^2 + 3x + 2 \\ f(x) &= x^2 \; + 3x \; + 2 \\ f(x) &= x^2 \; + 3x \; + 2 \\ f(x) &= x^2 \; + 3x \; + 2 \\ f(x) &= x^2 \; + 3x \; + 2 \\ f(x) &= x^2 \; \; + 3x \; \; + 2 \\ f(x) &= x^2 \; \; \; + 3x \; \; \; + 2 \end{aligned}$$

$$c \; d$$

1.9 Display styles

$$\int_a^b x dx = 2$$
$$\int_a^b x dx = 2$$
$$f(x) = 2$$
$$f(x) = 2$$

1.10 fonts

$$3x^2 = 3 + 3$$
$$3x^2 = 3 + 3$$
$$3\mathrm{x}^2 = 3 + 3$$
$$\mathcal{3}x^{\mathcal{2}} = \mathcal{3} + \mathcal{3}$$
$$\mathbf{3x^2} = \mathbf{3} + \mathbf{3}$$
$$3\mathrm{x}^2 = 3 + 3$$
$$3\mathrm{x}^2 = 3 + 3$$

1.11 Proofs and Theorems

Theorem title 1.11.1. *This is a test of what the theorem environment is capable of*

proof title 1.11.1.1. *Testing again!* \square

Remark title. test test