# A FISTFUL OF SHORTCUTS

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A *prime number* is a natural number divisible only by 1 and itself.

Quick shortcuts: `\vp`: $\varphi$. Let $\varepsilon \to 0$. We have $\mathbb{Z} \hookrightarrow \mathbb{Q}$ and $\mathbb{C} \cong \mathbb{R}^2 \twoheadrightarrow \mathbb{R}$. This map is homotopic to $\mathrm{id} : \mathrm{pt} \to \mathrm{pt}$.

Some calculus: $f(x)\,\mathrm{d}x$, but no $\mathrm{d}y$. Partial derivatives:

$$\frac{\mathrm{d}f}{\mathrm{d}t} \text{ and } \frac{\partial g}{\partial x}.$$

Delimiters: $(a, b)$, $\langle a, b\rangle$, $|a - b|$, $\|a - b\|$, $[a, b]$, and $\{a, b\}$.

Quote: $a^{(1)}, \ldots, a^{(10)}$.

Now, for a parade of math operators.

**Algebra:** $\mathrm{Ann}_A M$, $\mathrm{Cliff}(V)$, $\mathrm{coker}(\varphi)$, $\mathrm{End}(V)$, $\mathrm{Ext}(\mathbb{Z}/m, \mathbb{Z}/n)$, $\mathrm{Frac}(R)$, $\mathrm{Gal}(\overline{\mathbb{Q}}/\mathbb{Q})$, $\mathrm{Hom}(A, B)$, $\mathrm{Im}(\varphi)$, $\mathrm{Mat}_n(\mathbb{R})$, $\mathsf{C}^{\mathsf{op}}$, $\mathrm{sign}(\sigma)$, $\mathrm{span}\{x, y\}$, $\mathrm{Stab}_G x$, $\mathrm{Sym}^2 M$, $\mathrm{Tor}(\mathbb{Z}/m, -)$.

**Algebraic Geometry:** $\mathrm{Proj}\, R$, $\mathrm{QCoh}(X)$, $\mathrm{res}^V_U(f)$, and $\mathrm{Spec}\, k[x]$.

**Algebraic Topology:** $H^i_{\mathrm{dR}}(\mathrm{Gr}_k(\mathbb{R}^n))$, $\widetilde{H}^0(\mathrm{pt})$, $KO(S^2)$.

**Complex Analysis:** $\mathrm{Re}(z)$, $\mathrm{Im}(z)$.

**Topology:** $\mathrm{codim}\, Y$, $\mathrm{crit}(f)$, $\mathrm{curl}\, \vec{v}$, $\mathrm{div}\, \vec{v}$, $\mathrm{ind}\, \vec{v}$, and $\mathrm{supp}\, f$.

Now, for a bunch of letters.

**Blackboard Bold:** $\mathbb{A}^n$, $\mathbb{C}$, $\mathbb{D}$, $\mathbb{E}[x]$, $\mathbb{F}_p$, $\mathbb{G}_m$, $\mathbb{H}$, $\mathbb{N}$, $\mathbb{P}^n$, $\mathbb{Q}$, $\mathbb{R}$, $\mathbb{S}$, $\mathbb{T}$, $\mathbb{Z}$, $\mathbb{RP}$, $\mathbb{CP}$.

**Calligraphic:** $\mathcal{A}$, $\mathcal{M}_{g,n}$.

**Fraktur:** $\mathfrak{p}, \mathfrak{q} \subset R$, $k[x]/\mathfrak{m}$, $\mathfrak{g}$, $\mathfrak{gl}_n$, $\mathfrak{sl}_n$, $\mathfrak{sp}_n$, $\mathfrak{o}_n$, $\mathfrak{so}_n$, $\mathfrak{u}_n$, $\mathfrak{su}_n$, $U \in \mathfrak{U}$.

**Roman:** $\mathrm{GL}_n(\mathbb{R})$, $\mathrm{SL}_n(\mathbb{R})$, $\mathrm{O}_n$, $\mathrm{SO}_n$, $\mathrm{U}_n$, $\mathrm{SU}_n$, $\mathrm{Sp}_n$, $\mathrm{Spin}_n$, $\mathrm{PGL}_2(\mathbb{C})$, $\mathrm{PSL}_2(\mathbb{Z})$.

**Script:** $f : \mathscr{F} \to \mathscr{G}$, $g : \mathscr{H} \to \mathscr{I}$, $\mathscr{L} \otimes_{\mathscr{O}_X} \mathscr{M}$.

**Sans serif:** $\mathsf{C}$, $\mathsf{D}$, $\mathsf{Set}$, $\mathsf{Grp}$, $\mathsf{Gpd}$, $\mathsf{Ab}$, $\mathsf{Ring}$, $\mathsf{Mod}_A$, $\mathsf{Alg}_k$, $\mathsf{Vect}_k$, $\mathsf{Top}$, $\mathsf{LocRing}$, $\mathsf{AffSch}$, $\mathsf{Sch}$, $\mathsf{Man}$, $\mathsf{Fun}$.