Cheat Sheet

Page	Expression	Name	Say	Meaning
5	$\mathcal{P}$	Script P	Proposition	Something to be proved
5	$\mathcal{P}(a)$	Script P of a	Proposition about tree a	Something to be proved about AST a
5	$\mathcal{O}$	Script O	Operator	An operator that can be used in an AST
5	$\mathcal{O}(a)$	Script O of a	Operator of arity a	An operator of a given arity
5	$\mathcal{X}_s$	Script X sub s	Variables x of sort s	Variables x of sort s
5	S	S	A set of sorts	A set of sorts
5	$\{X_s\}_{s\in\mathcal{S}}$	Family	Family X of s	a sort-indexed family of disjoint finite sets X_s of variables x of sort s
6	$[b/x]\,a$	Substitution	Substitute b for x in a	Substitute b for x in a
7	$x_1, ..., x_n.a$	Abstractor	Bind variables x_n to expression a	Bind variables x_n to expression a
8	$\overrightarrow{x}$	X arrow	List of xs	$x_1, ..., x_n$
8	$\rho : \overrightarrow{x} \leftrightarrow \overrightarrow{x}'$	Fresh renaming	Freshen x using renaming ρ	A bijection between $\overrightarrow{x}$ and $\overrightarrow{x}'$ where $\overrightarrow{x}'$ is fresh.
8	$\widehat{\rho_i}(a_i)$	Rho hat sub i	Rename result	The result of applying the renaming ρ_i to a_i
8	$x =_\alpha y$	Equal alpha	*α-equivalence*	Trees x and y equal up to renaming
9	$x \triangleq^{\Delta} y$	Delta equals	Replacement	Replace expression x with expression y
13	τ type	Type	Type τ	Judgement that τ is a type
13	$e : \tau$	Colon	e is of type τ	Judgement that expression e is of type τ
13	$e \Downarrow v$	Down arrow	e has value v	Judgement that expression e has value v
14	$\frac{J_1 ... J_k}{J}$	Surfboard	Infers	Judgements $J_1 ... J_k$ infer judgement J
23	$J_1 ... J_k \vdash_{\mathcal{R}} \mathcal{K}$	Turnstile	Entails	Given $\mathcal{R}$ and J infer $\mathcal{K}$
23	Γ	Gamma	Judgements Gamma	A finite set of judgements
23	Δ	Delta	Judgements Delta	A finite set of type judgements
25	$\Gamma \models_R J$	Double turnstile	Admissible	$\vdash_R \Gamma$ implies $\vdash_R J$
28	$\bigtriangledown$	Down triangle	Generic derivation	Generic derivation
36	$n ::= s$	Colon colon equals	The syntax of n is s	Specifies the syntax of n
36	;	Semicolon	And	Separates arguments to expressionsin abstact notation
41	$s \longmapsto s'$	Bar arrow	Transistion	State s transitions to state s'
42	$s \longmapsto^* s'$	Bar arrow star	Iterated transistion	State s transitions to state s' over more than zero transitions
42	$s \longmapsto^n s'$	Bar arrow n	N times iterated transistion	State s transitions to state s' over n transitions
44	$\mathcal{E}$	Script E	Expression context	Expression context
45	$\circ$	Circle	Hole	Placeholder to put an instruction
46	$e \equiv e'$	Equivalent	Definitional equivalence	e is definitionally equivalent to e'
58	e??	Wrong	E goes wrong	Expression e goes wrong

Page	Expression	Name	Say	Meaning
58	$e \Downarrow^k v$	Downarrow k	E evaluates in k steps	Expression e evaluates to v in k steps
63	$\{f\}$	Brace brackets	Function	Surround function f in abstract notation
63	$f.e$	Dot	Dot	Introduces the scope e of a function f in abstract notation
64	$f(\tau_1) : \tau_2$	Function	Function definition	A function taking an argument of type τ_1 and returning a value of type τ_2
64	$\|[x/e/f]\|e'$	Script bracket	Function substitution	Function substitution
65	$\tau_1 \to \tau_2$	Right arrow	Maps to	A total function that maps elements of type τ_1 to elements of type τ_2
65	λ	Lambda	Lambda	Abstraction
71	$\hookrightarrow$	Hook arrow	Select	Deconstructor selector
71	$\|$	Bar	Either	A choice
71	$\overline{n}$	Overline	Succession	The the succession expression corresponding to the number n
76	$\lceil n \rceil$	Divided hat	Gödel numbering	Gödel numbering
81	$<>$	Angle brackets	Null tuple	Null tuple
81	$< e_1, e_2 >$	Angle brackets	Ordered pair	Ordered pair
81	e.l	Left	Left projection	Select left member of the ordered pair
81	e.r	Right	Right projection	Select right member of the ordered pair
121	$t.\tau$	Dot	Type operator	Bind t to type τ
133	$\cong$	Tilde equal	Isomorphism	Isomorphism
157	::	Colon colon	Kind type constructor	Maps types to types
166	$\mapsto$	Short bar arrow	Maps to	Function definition
166	$\bot$	Bottom	Bottom	Totally undefined partial function
167	$\tau_1 \rightharpoonup \tau_2$	Harpoon	Partial function	Partial function
177	_	Underscore	Underscore	Unfree variable
185	Λ	Lambda	Lambda calculus	The lambda calculus
188	Y	Y	Y Combinator	The Y combinator
190	$x^\dagger$	Superscript cross	Superscript cross	Language isomorphism