3

If $\mathcal{C}(X,Y)$ is always a set, $\mathcal{C}$ is locally small.

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2

For a category $\mathcal{C}$ and an object C, $\mathcal{C}/C$ is the slice category. Objects are arrows to C.

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$\varnothing$

A natural transformation between two functors $F, G : \mathcal{C} \to \mathcal{D}$ is a family $(\mu_C : FC \Rightarrow GC)_{C \in \mathcal{C}_0}$.

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11

Equalizers - if existent - are determined up to isomorphism.

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7

Every functor preserves isomorphism.

Every functor preserves isomorphism. 7

5

Given a category $\mathcal{C}$ with objects X, Y, $\mathcal{C}(X,Y)$ is the class of arrows from X to Y.

Given a category $\mathcal{C}$ with objects X, Y, $\mathcal{C}(X,Y)$ is the class of arrows from X to Y. 5

$\aleph_\lambda$

If a category has a terminal object $\mathbf{1}$, every object is its own product with $\mathbf{1}$.

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ω

Coproducts have no general description in terms of their generalized elements.

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∞

Equivalent subobjects have isomorphic domains.

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The functor $Y : \mathcal{C} \to \mathrm{Set}^{\mathcal{C}^{op}}$ is full and faithful. 3

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A category is equivalent to a discrete category iff it is a groupoid and a preorder. 2

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Given $\mathcal{C}$ and $\mathcal{D}$, the constant functor $\Delta_D : \mathcal{C} \to \mathcal{D}$ assigns D to every object and $\mathbf{1}_D$ to every arrow. $\varnothing$

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A faithful functor reflects epis and monos. 11

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For A object of $\mathcal{C}$, $h : f \to g$ of $\mathcal{C}/A$ is monic iff h is monic in $\mathcal{C}$. 7

For A object of $\mathcal{C}$, $h : f \to g$ of $\mathcal{C}/A$ is monic iff h is monic in $\mathcal{C}$. 7

Every equalizer is monic. 5

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An arrow is fully determined by its effects on generalized elements. $\aleph_\lambda$

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Limits are equalizers of products. ω

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The cones for a diagram form a category; the limit is the terminal object of this. ∞

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3

If $F : \mathcal{A} \to \mathcal{B}$, B in $\mathcal{B}$ and a reflection along B exists, it is unique up to isomorphism.

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An embedding is a functor which is full and faithful and injective on objects.

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$\varnothing$

The slogan is: "Adjoint functors arise everywhere."

$\varnothing$

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11

In cartesian closed categories, coproducts distribute over products.

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Theories in the simply typed λ-caluculus correspond to cartesian closed categories.

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Theories in the simply typed λ-caluculus correspond to cartesian closed categories.

5

A category with all products and equalizers also has all pullbacks.

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$\aleph_\lambda$

(Yoneda Lemma) For F of $Set^{\mathcal{C}^{op}}$, C of $\mathcal{C}$ there is a bijection $f_{C,F} : Set^{\mathcal{C}^{op}}(h_c, F) \to F(C)$.

$\aleph_\lambda$

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ω

Natural numbers object:

$$\begin{tikzcd}
\mathbf{1} \arrow[r] \arrow[dr] & N \arrow[r] \arrow[d] & N \arrow[d] \\
& A \arrow[r] & A
\end{tikzcd}$$

ω

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\end{tikzcd}$$

∞

If there is an inital object $\mathbf{0}$ and an arrow $\mathbf{1} \to \mathbf{0}$ then $\mathbf{0}$ and $\mathbf{1}$ are zero objects.

∞

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If $G \circ F$ is an embedding, then so is F. 3

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For toposes $\mathcal{E}$, $\mathcal{E}'$ also $\mathcal{E} \times \mathcal{E}'$ is a topos. 2

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A universal property is itself a reason to study it. $\varnothing$

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Every monotone map of X to a ω-cpo factors uniquely through the limits of this cpo. 11

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If a category has a terminal object and pullbacks, it has binary products and equalizers. 7

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In a topos $\mathcal{E}$, one can interpret many-sorted predicate logic which also has constructors for subsets. 5

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Each presheaf is a colimit of a representable presheaf. $\aleph_\lambda$

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In $Set^{\mathcal{C}^{op}}$ limits are computed pointwise. ω

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In a topos, all monics are equalizers and all monic epics are iso. ∞

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Objects that represent the same functor are isomporphic. 3

Objects that represent the same functor are isomporphic. 3

Coequalizers cannot be defined in terms of general elements. 2

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"It should be observed that the whole concept of a category is essentially an auxillary one." $\varnothing$

(Eilenberg & McLane)

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A subcategory $\mathcal{C}$ of $\mathcal{D}$ is full if for all A, B: $\mathcal{C}(A, B) = \mathcal{D}(A, B)$. 11

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A full and faithful functor reflects the property of being a terminal or initial object. 7

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For each functor $T : X \to X$, the forgetful functor of $\mathbf{Alg}(T)$ creates limits. 5

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In a topos, take $x : \mathbf{1} \to A$, $w : A \to \Omega$. Then $x \in^{A}$'w' iff $x \in w^*$. $\aleph_\lambda$

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Each colimit is an extremal epi-sink. ω

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If $F : \mathcal{C} \to \mathcal{D}$ a full, faithful functor, $\forall f : FA \to FB$ $\exists_1$ $g : A \to B$ with $Fg = f$. ∞

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