



planetmath.org

Math for the people, by the people.

A.1.4 Coproduct types

Canonical name	A14CoproductTypes
Date of creation	2013-11-09 4:51:41
Last modified on	2013-11-09 4:51:41
Owner	PMBookProject (1000683)
Last modified by	PMBookProject (1000683)
Numerical id	1
Author	PMBookProject (1000683)
Entry type	Application
Classification	msc 03B15

We introduce primitive constants  $c_+$ ,  $c_{\text{inl}}$ , and  $c_{\text{inr}}$ . We write  $A+B$  instead of  $c_+(A, B)$ ,  $\text{inl}(a)$  instead of  $c_{\text{inl}}(a)$ , and  $\text{inr}(a)$  instead of  $c_{\text{inr}}(a)$ :

- if  $A, B : \mathcal{U}_n$  then  $A + B : \mathcal{U}_n$
- moreover,  $\text{inl} : A \rightarrow A + B$  and  $\text{inr} : B \rightarrow A + B$

If we have  $A$  and  $B$  as above,  $C : A + B \rightarrow \mathcal{U}_m$ ,  $d : \prod_{(x:A)} C(\text{inl}(x))$ , and  $e : \prod_{(y:B)} C(\text{inr}(y))$ , then we can introduce a defined constant  $f : \prod_{(z:A+B)} C(z)$  with the defining equations

$$f(\text{inl}(x)) \equiv d(x) \quad \text{and} \quad f(\text{inr}(y)) \equiv e(y).$$