

$$\begin{aligned}
 \overline{f \cdot (g \times h)} &= \overline{a_f \cdot (id \times h) \cdot \overline{f} \cdot g} \\
 &\stackrel{35}{=} a_f \cdot ((\overline{a_f \cdot (id \times h) \cdot \overline{f} \cdot g}) \times id) \\
 &= \dots
 \end{aligned}$$

$$\kappa = \overline{f} \Leftrightarrow f = a_f \cdot (\kappa \cdot id)$$

$$\begin{aligned}
 \overline{f \cdot (g \times h)} &= \overline{a_f \cdot (id \times h) \cdot \overline{f} \cdot g} \\
 &\stackrel{38}{=} \overline{a_f \cdot (id \times h) \cdot (\overline{f} \times id) \cdot g} \\
 &\stackrel{14}{=} \overline{a_f \cdot (id \cdot \overline{f}) \times (h \cdot id) \cdot g} \\
 &= \overline{a_f \cdot (\overline{f} \times h) \cdot g} \\
 &= \overline{a_f \cdot (\overline{f} \times h) \cdot (g \times id)} \\
 &\stackrel{14}{=} \overline{a_f \cdot (\overline{f} \cdot g) \times h} \\
 &\stackrel{38}{=} \overline{a_f \cdot (f \cdot (g \times id) \times h)} \\
 &\stackrel{1 \times 2}{=} \overline{a_f \cdot (f \cdot (g \times id) \cdot id) \times (id \cdot h)} \\
 &\stackrel{14}{=} \overline{a_f \cdot (f \cdot (g \times id)) \times id \cdot (id \times h)} \\
 &= \overline{f \cdot (g \times id) \cdot (id \times h)} \\
 &= \overline{f \cdot (g \cdot h)} \neq
 \end{aligned}$$

$$\textcircled{2} \quad \text{flip } f = \overline{\hat{f}} \cdot \text{swap}$$

$$\text{flip}(\text{flip } f) = f$$

$$\text{flip}(\overline{\hat{f}} \cdot \text{swap}) = f$$

$$\Leftrightarrow \overline{\overline{\hat{f}} \cdot \text{swap} \cdot \text{swap}} = f$$

$$\Leftrightarrow \overline{\hat{f} \cdot \text{swap} \cdot \text{swap}} = f$$

$$\Leftrightarrow \overline{\hat{f}} = f$$

$$\text{flip } f \circ x = f \circ x$$

...

$$\begin{array}{ccc}
 & \xrightarrow{\text{unijoin}} & \\
 A^{B+C} & \xrightarrow{\quad} & A^B \times A^C \\
 & \xleftarrow{\quad} &
 \end{array}$$

$$\begin{cases}
 \text{join } (f, g) = [f, g] \\
 \text{unijoin } \kappa = (\kappa \cdot i_1, \kappa \cdot i_2)
 \end{cases}$$



[...]

$$\forall K \mid (junc \circ injunc) K = id K$$

$$\Leftrightarrow \forall K \mid junc (K \circ i_1, K \circ i_2) = K$$

$$\Rightarrow \forall K \mid [K \circ i_1, K \circ i_2] = K$$

$$\Rightarrow \forall K \mid K \circ i_1 = K \circ i_1 ; K \circ i_2 = K \circ i_2$$

$$\Rightarrow \forall K \mid TRUE$$

(...)

$$4. \begin{cases} \text{for } b \ i \ 0 = i \\ \text{for } b \ i \ (n+1) = b(\text{for } b \ i \ n) \end{cases}$$

$$\Leftrightarrow \begin{cases} \text{for } b \ i \ (\underline{0} \ x) = \underline{i} \ x \\ \text{for } b \ i \ (\text{succ } m) = b(\text{for } b \ i \ m) \end{cases}$$

$$\Rightarrow \begin{cases} ((\text{for } b \ i \ 0) \ x) = \underline{i} \ x \\ ((\text{for } b \ i) \cdot \text{succ}) \ m = (b \cdot (\text{for } b \ i)) \ m \end{cases}$$

$$\Leftrightarrow \begin{cases} (\text{for } b \ i) \cdot \underline{0} = \underline{i} \\ (\text{for } b \ i) \cdot \text{succ} = b \cdot (\text{for } b \ i) \end{cases}$$

$$\Rightarrow \begin{cases} (\text{for } b \ i) \cdot \text{im} \cdot i_1 = \underline{i} \\ (\text{for } b \ i) \cdot \text{im} \cdot i_2 = b \cdot (\text{for } b \ i) \end{cases}$$

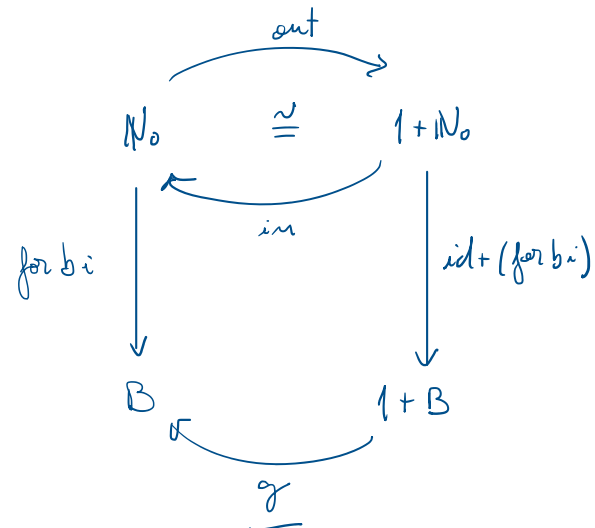
$$\Leftrightarrow (\text{for } b \ i) \cdot \text{im} = [\underline{i}, b \cdot (\text{for } b \ i)]$$

$$\Rightarrow (\text{for } b \ i) \cdot \text{im} = [\underline{i} \cdot id, b \cdot (\text{for } b \ i)]$$

$$\Rightarrow (\text{for } b \ i) \cdot \text{im} = [\underline{i}, b] \cdot (id \times (\text{for } b \ i))$$

$$\Rightarrow (\text{for } b \ i) \cdot \text{im} = \Delta [\underline{i}, b] \Delta$$

$$\therefore g = [\underline{i}, b] \leftarrow$$



$$\textcircled{5} \begin{cases} a + 0 = a \\ a + (n+1) = 1 + (a + n) \end{cases}$$

