

Exercise: $\boxed{* \bullet} = 0$

Proof: $\boxed{* \bullet} = H \boxed{*} - H \boxed{*}$. \square

Proof: $\text{circle with dots} = 1$

$$\boxed{*} = \boxed{*} - 0 = \boxed{*}. \quad \square$$

$\boxed{\bullet \bullet} = H(\boxed{\bullet})$ Remark: In $\text{Cob}(3, *)$ $H\left(\begin{array}{c} \boxed{\bullet} \\ \boxed{*} \end{array}\right)$

Proof: ~~$\boxed{\bullet \bullet}$~~ $\begin{array}{c} \boxed{\bullet \bullet} \\ \boxed{*} \end{array} = \underbrace{\begin{array}{c} \boxed{\bullet} \\ \boxed{*} \end{array}} + \cancel{H\left(\begin{array}{c} \boxed{\bullet} \\ \boxed{*} \end{array}\right)} - \begin{array}{c} \boxed{\bullet} \\ \boxed{\text{circle}} \end{array}.$

$$\left\{ \begin{array}{c} \boxed{\text{circle}} \\ \boxed{\text{circle}} \end{array} - \begin{array}{c} \boxed{\text{circle}} \\ \boxed{\text{circle}} \end{array} \right\} \times$$

$$\stackrel{4TU}{=} - \begin{array}{c} \boxed{\text{circle}} \\ \boxed{\text{circle}} \end{array} + \begin{array}{c} \boxed{\text{circle}} \\ \boxed{\text{circle}} \end{array} \Rightarrow X = -X \Rightarrow X = 0. \quad \square$$

(iii) - Neck cutting - equiv to 4TU. \square