1 Notation

1.1 Hyperoperation

$$a + b = a \overset{1}{\text{—}\!\!+\!\!\text{—}} b \tag{1}$$

$$a \cdot b = a \overset{2}{\text{—}\!\!+\!\!\text{—}} b \tag{2}$$

$$a^b = a \overset{3}{\text{—}\!\!+\!\!\text{—}} b \tag{3}$$

$$\underbrace{a \overset{n}{\text{—}\!\!+\!\!\text{—}} a \overset{n}{\text{—}\!\!+\!\!\text{—}} \ldots a}_{\text{b}} = a \overset{n+1}{\text{—}\!\!+\!\!\text{—}} b \tag{4}$$

1.2 Inverse-hyperoperation

$$c \overset{1}{\text{—}\!\!\div\!\!\text{—}} b = c - b \tag{5}$$

$$c \overset{2}{\text{—}\!\!\div\!\!\text{—}} b = \frac{c}{b} \tag{6}$$

$$c \overset{3}{\text{—}\!\!\div\!\!\text{—}} b = \log_b c \tag{7}$$

$$c \overset{n}{\text{—}\!\!\div\!\!\text{—}} b = a \tag{8}$$

1.3 Hyperoperations with fractional "exponents"

$$a + \frac{b}{q} = a \overset{1}{\text{—}\!\!+\!\!\text{—}} \frac{b}{q} \tag{9}$$

$$a \cdot \frac{b}{q} = a \overset{2}{\text{—}\!\!+\!\!\text{—}} \frac{b}{q} \tag{10}$$

$$a^{\frac{b}{q}} = \sqrt[q]{a^b} = a \overset{3}{\text{—}\!\!+\!\!\text{—}} \frac{b}{q} \tag{11}$$

$$\underbrace{a \overset{n}{\text{—}\!\!+\!\!\text{—}} a \overset{n}{\text{—}\!\!+\!\!\text{—}} \ldots a}_{\text{"b/q"}} = a \overset{n+1}{\text{—}\!\!+\!\!\text{—}} \frac{b}{q} \tag{12}$$