

Hoja de trabajo # 3 Javier Lopez — Jorge Guerrero

Ejercicio #1

$$\begin{aligned} & [\sigma(\sigma(\sigma(0)))] + [\sigma(\sigma(\sigma(\sigma(0))))] \\ s(0) &= 1 \\ \sigma(\sigma(\sigma(0))) &+ \sigma(\sigma(\sigma(1))) \\ (\sigma(\sigma(\sigma(0))) &+ \sigma(\sigma(\sigma(1)))) \\ (\sigma(\sigma(\sigma(\sigma(0)))) &+ \sigma(\sigma(1))) \\ (\sigma(\sigma([\sigma(\sigma(\sigma(0))]) &+ \sigma(1))) \\ (\sigma(\sigma(\sigma([\sigma(\sigma(\sigma(0))]) &+ 1))) \\ (\sigma(\sigma(\sigma(\sigma(\sigma(\sigma(0 + 1)))))) & \\ (\sigma(\sigma(\sigma(\sigma(\sigma(\sigma(1)))))) &= (\sigma(\sigma(\sigma(\sigma(\sigma(2)))))) \\ (\sigma(\sigma(\sigma(\sigma(\sigma(3)))))) &= \sigma(\sigma(\sigma(4))) = \sigma(\sigma(5)) = \sigma(6) = 7 \end{aligned}$$

Ejercicio #2

$$a * b = \begin{cases} a / b = 1 \\ 0 / a = 0 \vee b = 0 \\ b + ((x) * b) / a = \sigma(x) \end{cases}$$

Ejercicio #3

$$\begin{aligned} & (\sigma(\sigma(\sigma(0))) * 0 = a * 0 = 0 \\ & (\sigma(\sigma(\sigma(0))) * (\sigma(0) = (\sigma(0) = 1 = (\sigma(\sigma(\sigma(0))) * 1 = (\sigma(\sigma(\sigma(0))) = (\sigma(\sigma(1)) = \sigma(2) = 3 \\ & (\sigma(\sigma(\sigma(0))) * (\sigma(\sigma(0)) = 3 * 2 = 3 + 3 \vee 2 + 2 + 2 = 6 \end{aligned}$$

Ejercicio #4

$$\begin{aligned} & a + (\sigma(\sigma(0))) = (\sigma(\sigma(a))) \\ & (\sigma(a + \sigma(0))) = (\sigma(\sigma(a))) \\ & (\sigma(\sigma(a + 0))) = (\sigma(\sigma(a))) \\ & (\sigma(\sigma(a))) = (\sigma(\sigma(a))) \end{aligned}$$

$$\begin{aligned} & a * b = b * a \sigma(a) * b = b * \sigma(a) \\ & \sigma(a) + (\sigma(a) * x) = (x * \sigma(a)) + \sigma(a) \\ & \sigma((a) + (\sigma(a) * x)) = \sigma((x * \sigma(a)) + \sigma(a)) \\ & \sigma((a) + (\sigma(a) * x)) = \sigma((a) + (\sigma(a) * x)) \\ & \sigma(a) + (\sigma(a) * x) = \sigma(a) + (\sigma(a) * x) \\ & (\sigma(a) * b) = (\sigma(a) * b) \\ & a + (a * b) = a + (a * b) \\ & a * b = a * b \end{aligned}$$

$$\begin{aligned} & a * (b * c) = (a * b) * c \\ & \sigma(a) * (b * c) = (\sigma(a) * b) * c \\ & \sigma(a) * (b * c) = ((\sigma(a) + (\sigma(a) * x)) * c) \\ & \sigma(a) * (b * c) = ((\sigma(a) * (b)) * c) \\ & \sigma(a) * (b * c) = (\sigma(a) * (b) * c) \\ & \sigma(a) * (b * c) = (\sigma(a) * b * c) \\ & \sigma(a) * (b * c) = \sigma(a) * (b * c) \end{aligned}$$

$$(a + b) * c = (a * c) + (b * c)$$

$$\begin{aligned}
(\sigma(x) + b) * c &= (\sigma(x) * c) + (b * c) \\
(\sigma(x + b) * c) &= (\sigma(x) * c) + (b * c) \\
((\sigma(x) + b) * c) &= (\sigma(x) * c) + (b * c) \\
((\sigma(x) * c) + (b * c)) &= (\sigma(x) * c) + (b * c) \\
(\sigma(x) * c) * (b * c) &= (\sigma(x) * c) + (b * c)
\end{aligned}$$

$$\begin{aligned}
(\sigma(x) * c + b * c) &= (\sigma(x) * c) + (b * c) \\
(\sigma(x) * c) + (b * c) &= (\sigma(x) * c) + (b * c)
\end{aligned}$$