

a)

$$\begin{aligned}
& \lambda \mathbf{a}. \left(\lambda b. \left(\lambda c. \left(b((\mathbf{a}b)c) \right) \right) \right) \left(\lambda d \left(\lambda e. \left(d(d(\mathbf{d}e)) \right) \right) \right) \\
& \lambda b. \left(\lambda c. \left(b \left(\left(\left(\lambda d \left(\lambda e. \left(d(d(\mathbf{d}e)) \right) \right) \right) b \right) c \right) \right) \right) \\
& \lambda b. \left(\lambda c. \left(b \left(\left(\lambda e. \left(b(b(\mathbf{b}e)) \right) c \right) \right) \right) \right) \\
& \lambda b. \left(\lambda c. \left(b \left(b(b(\mathbf{b}c)) \right) \right) \right)
\end{aligned}$$

b)

$$\begin{aligned}
& \lambda \mathbf{a}. \left(\lambda b. \left(\lambda f. \left(\lambda x \left((\mathbf{a}f)((bf)x) \right) \right) \right) (\lambda f. (\lambda x. (fx))) \right) (\lambda \mathbf{f}. (\lambda \mathbf{x}. \mathbf{x})) \\
& \left(\lambda \mathbf{b}. \left(\lambda f. \left(\lambda x \left(((\lambda f. (\lambda x. x))f)((\mathbf{b}f)x) \right) \right) \right) (\lambda \mathbf{f}. (\lambda \mathbf{x}. (\mathbf{f}\mathbf{x}))) \right) \\
& \left(\lambda f. \left(\lambda x \left(((\lambda \mathbf{f}. (\lambda x. x))\mathbf{f})(((\lambda f. (\lambda x. (fx)))f)x) \right) \right) \right) \\
& \left(\lambda f. \left(\lambda x \left(((\lambda x. x))(((\lambda \mathbf{f}. (\lambda x. (fx)))\mathbf{f})x) \right) \right) \right) \\
& \left(\lambda f. \left(\lambda x \left(((\lambda x. x))(((\lambda \mathbf{x}. (fx))\mathbf{x}) \right) \right) \right) \\
& \left(\lambda f. \left(\lambda x \left(((\lambda \mathbf{x}. x))(((\mathbf{f}\mathbf{x})) \right) \right) \right) \\
& (\lambda f. (\lambda x(fx)))
\end{aligned}$$