

2. a)

$$\begin{aligned}
 & \lambda a. \left(\lambda b. \left(\lambda c. \left(b((ab)c) \right) \right) \right) \left(\lambda d. \left(\lambda e. \left(d(d(de)) \right) \right) \right) \\
 & \lambda b. \left(\lambda c. \left(b \left(\left(\lambda d. \left(\lambda e. \left(d(d(dc)) \right) \right) b \right) c \right) \right) \right) \\
 & \lambda b. \left(\lambda c. \left(b \left(\lambda e. \left(b(b(be)) \right) c \right) \right) \right) \\
 & \lambda b. \left(\lambda c. \left(b \left(b(b(bc)) \right) \right) \right)
 \end{aligned}$$

b)

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