**Resolução questão 1.a)**

replicate' :: Int → a → [a]

replicate' 0 \_ = []

replicate' n x = x : replicate' (n-1) x

replicate' 4 'a'

'a' : replicate' 3 'a'

'a' : replicate' 2 'a'

'a' : replicate' 1 'a'

'a' : replicate' 0 'a'

[]

''aaaa''

**Resolução questão 1.b)**

length' :: [a] → Int

length' [] = 0

length' (x:xs) = 1 + length' xs

length' [4,7,10,28]

1 + length' [7,10,28]

1 + 1 + length' [10,28]

1 + 1 + 1 + length' [28]

1 + 1 + 1 + 1 + length' []

1 + 1 + 1 + 1 + 0

4

**2. Reduza a expressão lambda à forma normal:**

(𝜆𝑥. 𝜆𝑦. (𝑥(𝜆𝑢. 𝜆𝑣. 𝑢))𝑦) (𝜆𝑎. 𝜆𝑏. 𝑎)(𝜆𝑐. 𝜆𝑑. 𝑑)

(𝜆𝑦. ((𝜆𝑎. 𝜆𝑏. 𝑎) (𝜆𝑢. 𝜆𝑣. 𝑢))𝑦) (𝜆𝑐. 𝜆𝑑. 𝑑)

((𝜆𝑎. 𝜆𝑏. 𝑎) (𝜆𝑢. 𝜆𝑣. 𝑢)) (𝜆𝑐. 𝜆𝑑. 𝑑))

((𝜆𝑏. (𝜆𝑢. 𝜆𝑣. 𝑢))) (𝜆𝑐. 𝜆𝑑. 𝑑))

(𝜆𝑢. 𝜆𝑣. 𝑢)