

람다 계산법에 관한 퍼즐

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재미 삼아 람다 계산법에 관한 다음의 문제를 풀어 보세요. 해답은 다음에 알려 드리겠습니다.

1. Find a term M such that $M M \rightarrow^* z$. $\lambda x.z$ is an obvious solution. Is there a solution in which the z on the right descends from a free occurrence of z in the second occurrence of M ?

2. Given any $n \geq 2$, and any i in $2 \dots n$, find a context $C[\]$ such that

$$C[z_1] C[z_2] \dots C[z_n] \rightarrow^* z_i$$

The extra condition is that $C[\]$ is closed. For $i=1$ it is trivially solvable by $C[x] = \lambda x_2 \dots x_n. x$. Find a non-trivial case.

3. For any given lambda expression G , find a lambda expression F satisfying

$$F x (F y) \rightarrow^* G x y$$

4. More generally, given any $n \geq 1$ and a lambda expression G , find a lambda expression F such that

$$(F z_1) \dots (F z_n) \rightarrow^* G z_1 \dots z_n$$

The problem 3 is the case of $n=2$.