

Perspectives in Mathematical Sciences I (Spring 2018)

Report for Part 2

Report delivery and deadline

You should either deliver your report to the support office (支援室) or send it to garrigue@math.nagoya-u.ac.jp by Tuesday 2018/07/10.

You can write your report either in English or Japanese, but English is preferred. You should solve **both** problems A and B.

Problem A

1. Compute the normal form of $c_2 c_2$ (as untyped Church Numeral).
2. Find T such that $c_2[T]$ ($c_2[\mathbf{Nat}]$) is well typed (using Church Numerals in System F), and compute the normal form.

Problem B

1. Write the typing derivation of

$$\lambda f : A \rightarrow B. \lambda g : C \rightarrow A. \lambda x : C. f (g x)$$

in the simply-typed lambda-calculus.

2. Write the corresponding proof in propositional logic.