

# Mathematical Logic — Assignment Three

January 16<sup>th</sup>, 2017

1. Illustrate the Gödel-Gentzen translation and briefly discuss its meaning.
2. Prove that there is a combinator  $\mathbf{Y}$  such that  $\mathbf{Y}x =_{\beta} x(\mathbf{Y}x)$ .
3. Show that  $\phi \equiv \neg\neg z \supset z$  cannot be proved in the intuitionistic propositional logic by providing a Heyting algebra which falsifies  $\phi$ .

Each question is worth 12 points. The points in all the four assignments will be added together and the result will be divided by 4, and this will be the final result. Remember to mark your answer sheet with your name.