

2025 年度 学習院大学大学院 自然科学研究科 博士前期課程 数学専攻
(夏季募集)

入学試験問題

英語

2024 年 7 月 6 日

注意事項： 問題は 3 題ある．全問に解答すること．

1 次の英文をすべて日本語に訳せ．

There are several forms of Cauchy's theorem, but they differ in their hypotheses rather than in their conclusions. It is easiest to begin with a case in which the hypotheses are minimal. We consider, specifically, a rectangle R defined by $a \leq x \leq b$, $c \leq y \leq d$. The parameter can be considered as a simple closed curve consisting of four line segments. One direction on R is that it lies to the left of the directed edge $a \rightarrow b$. The other is the boundary curve of R , and we denote it by ∂R . In the theorem that follows we consider a function which is analytic on the rectangle R . We recall to the reader that such a function is by definition defined and analytic in an open set which contains R . The following is a preliminary version of Cauchy's theorem.

Theorem. If the function $f(z)$ is analytic on R , then

$$\int_{\partial R} f(z) dz = 0$$

(出典: Lars Ahlfors, *Complex Analysis*, 一部改編)

2 次の英文をすべて日本語に訳せ．

There is a wonderful book about mathematical creation. The Psychology of Invention in the Mathematical Field by Jacques Hadamard. It was first published in 1945, and it is still as good and extremely relevant today. I recommend you pick up a copy. Hadamard makes two main points. The first is that the creative process begins with vague ideas and images and is only later formalized with symbols. About thirty percent of mathematicians, he tells us, think that way. The other ten percent work to combine the ideas first. The second is that there is mathematics even to solve to these stages.

著作権保護のため非公開となります。

注) Jacques Hadamard: ジャック・アダマール (フランスの数学者) bog down: 陥る
(出典: Ian Stewart, *Letters to a Young Mathematician*)

3 次を英文に訳せ.

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(出典: 寺沢寛一『自然科学者のための数学概論 増補版』, 一部改編)